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Flexibility and gender equality in housing

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Interior of a social housing rental home for the Carrer Tánger, 40 development.

Public housing building in Can Batlló.

CHAPTER

01 Flexibility and gender equality in housing

David H. Falagan
Doctor of Architecture

00. Introduction

In the introduction to *The image of the city*[1] by American urban planner Kevin Andrew Lynch – who studied users' experience of spaces – Lynch described the city as an entity whose moving elements are as important as the unmoving physical parts. His point of view is easy to understand if you look at the movement of people, traffic or the activities carried out on the street as being as important as the city's buildings or fixed infrastructure. The perception of the city not as a physical item but as an organic one that is in constant evolution is very similar to the view we could have of any occupied architectural work, but more particularly of residential ones. In fact, one could define a home as a shared-living group that inhabits a place defined by a set of spaces. This means that spaces are as important in the definition of housing as the functions and uses given to them by their inhabitants.

This approach to housing is probably not an original one although, from the architects' point of view, research has often focused on more 'static' aspects. Some leading architects of the second half of the 20th century, such as Christopher Alexander and N. John Habraken, already developed theories of housing, precisely placing at their centre not the formal conditions of architecture but the uses and occupation of spaces. Alexander's design patterns or Habraken's theory of supports respectively can be considered two examples of this interpretation.

For this reason, in the next few pages we will seek to analyse housing from a dual point of view: paying attention to the easily recognisable spaces that make up a home on the one hand, and considering the more everyday functions and uses that take place in it on the other.

In the context of collective housing, it is worth remembering that, for years, successive pieces of housing legislation have been passed resulting in the definition of a set of minimum compulsory physical conditions of habitability. Despite this, legislative efforts have historically focused on a quantitative definition that could explain a set of dimensions regarding health and comfort requirements, adapted to the standard occupancy of a home. This legislation could be considered to be valuable at the times of highest speculative pressure on mass housing production , particularly in the first half of the 20th century – but has proven to be insufficient at times, such as this, of demographic diversity, redefinition of shared-living models or a tendency towards the individual appropriation of spaces. As shown by all

1. Kevin Lynch (1998). *The Image of the City*. Barcelona: Gustavo Gili.

Interior of a home in the Glòries serviced housing development for the elderly.

the available statistics, neither the family models nor the age at which people access housing, nor the number of occupants in each home, nor even the uses that we demand from current homes, are represented as such in the inherited legislative models.

In this context, the legal definition of specific rooms with concrete conditions inevitably leads to a pre-established use for, and appropriation of, each area. In spite of this, such conditioning can be minimised during the design process, and the dimensions and relationships between rooms can be reconsidered in order to give maximum adaptability to spaces and minimise hierarchies when occupying them.

For this reason, in this article we will define an interpretation of the concepts of flexibility and adaptability that will be useful when analysing housing. In the final part of this document, we will apply this analysis to a few projects developed in recent years (mainly between 2013 and 2015) by the Barcelona Municipal Institute of Housing and Renovation with the aim of obtaining a diagnosis of the state of this matter and make a few recommendations for improvement.

However, it is worth noting that, in order to carry out the analysis, we have had to accept some simplifications that must be mentioned. First, the observations have been applied to projects at different stages of development, which are therefore still subject to change. Second, the analysis focuses on the homes' given configuration, thus focusing on a specific approach to the interior spaces of each housing unit. Finally, the projects reviewed include housing with land usage rights, housing for people affected by urban planning, social rental homes and institutional housing for the elderly. In spite of the configuration differences, particularly in this last case in which there are considerable differences in surface areas and in the operation of the development as a whole, we have chosen to apply the same battery of questions to all projects.

The projects reviewed include housing with land usage rights, housing for people affected by urban planning, social rental homes and institutional housing for the elderly.

In order to apply our method in this manner, the first element we will discuss is the capacity of a graphic assessment system that can convey a home's flexibility and equality conditions.

01. Housing and representation

Architectural assessment mechanisms have become tools which, although occasionally seen with scepticism from a blueprint designer's perspective, provide objective information to people from outside this discipline. Their role must be particularly relevant for the assessment of the architectural design of homes, which few people design but everyone occupies.

For this reason, this analysis aims to define in a recognisable way the representation of the qualities present in housing projects. The analysis is thus useful in three different ways: it can provide a useful tool as a guide during the design process; it can provide a valid tool for adapting it to regulatory procedures; and it can be an essential way of conveying the most important qualitative features to be taken into account in a domestic environment.

Based on the need to set parameters for certain housing conditions, we consider what conditions should be taken into account in order to provide an appropriate representation of this analysis.

Nowadays, it would be unthinkable to buy a packet of biscuits in the supermarket without first checking the list of ingredients or the nutrition information on the label. No one would even think of buying a new car without thoroughly reviewing its power or fuel efficiency on the technical data sheet. No one would ever take home a fridge without checking the energy rating on the label. Not even when we buy the clothes we wear do we fail to first check their composition and washing instructions.

All this information enables us to know more about the products beyond their physical appearance: it is information that is directly related to a brand's use, comfort, energy consumption, health quality or even social value; for example in cases in which information on organic means of production or local trading is provided. This situation results in a paradox: it is easier to ascertain the number of cubic metres of storage in our car than those of our own home, or to establish the energy efficiency of a fridge than that of our home as a whole.

In the case of all these items – food, vehicles, clothing, household appliances, etc. –, these characteristics were taken into account during their production process. Assessing this process guarantees the characteristics of the products such that their final quality is reflected in a number of parameters that can be compared. These are explained to the people who buy them and use them by means of quality seals, labels or data sheets. There is therefore a triple process at play: the definition of the parameters, the assessment of their implications and the information provided to users.

Construction is clearly subject to quality controls: in relation to structural safety, to protection against the risk of fire, to a variety of health-related aspects and, particularly more recently, to energy performance. In addition, in the case of housing, there are often legal requirements as to habitability and accessibility that basically establish minimum (quantitative) dimensions that guarantee its use. In spite of this, there are a great many qualitative parameters that are often neither regulated nor assessed nor explained to users and which are crucial to the quality of a residential environment.

Any housing analysis must undoubtedly take into account both quantitative and qualitative factors, and we should look at them in combination with each other. The experiences of the successive residential assessment traditions of the 20th century show a gradual contribution of qualitative parameters which, although often not quantifiable, are identifiable. Identifying and defining such parameters and making them objective is thus the first challenge if we want to move towards assessing certain conditions of a home.

If you look at the majority of the current legislation, many of the considerations governed by it can be considered obsolete. Anyone can see that social, urban or technological changes take place much faster than regulatory or legislative changes.

If you look at most of the current legislation, as mentioned in the introduction, many of the considerations governed by it can be considered obsolete. Anyone can see that social, urban or technological changes take place much faster than regulatory or legislative changes. Paradigms must be reviewed from various points of view, as well as from the various levels of approach to the residential reality.

In any case and along these lines, the assessment of housing is not aimed at regulating it but is carried out from an analytical point of view: one that allows us to identify the parameters that provide quality to residential actions, which makes it easier to consider the objective values it provides and makes it possible to convey them to the people who live in them, both now and in the future. It is an operational assessment, one that provides value as a project tool and as a tool for critical analysis. This is why our first task will involve defining the concepts of flexibility and equality that we will be using in these pages.

02. Flexibility and gender equality

In this analysis of housing, the concepts of flexibility and gender equality have been used as arguments relating to the aspirations of collective housing: maximum versatility of use for the people who use it and minimal hierarchical conditioning in its layout. It is worth briefly clarifying in this regard how these concepts are interpreted here and how they can be applied to our analysis.

Adaptability and flexibility

Although here we talk about *flexibility*, the term that best defines our conceptual approach is *adaptability*. In relation to this, we agree with the terminology used by professors Jeremy Till and Tatjana Schneider in their research on flexible housing[2].

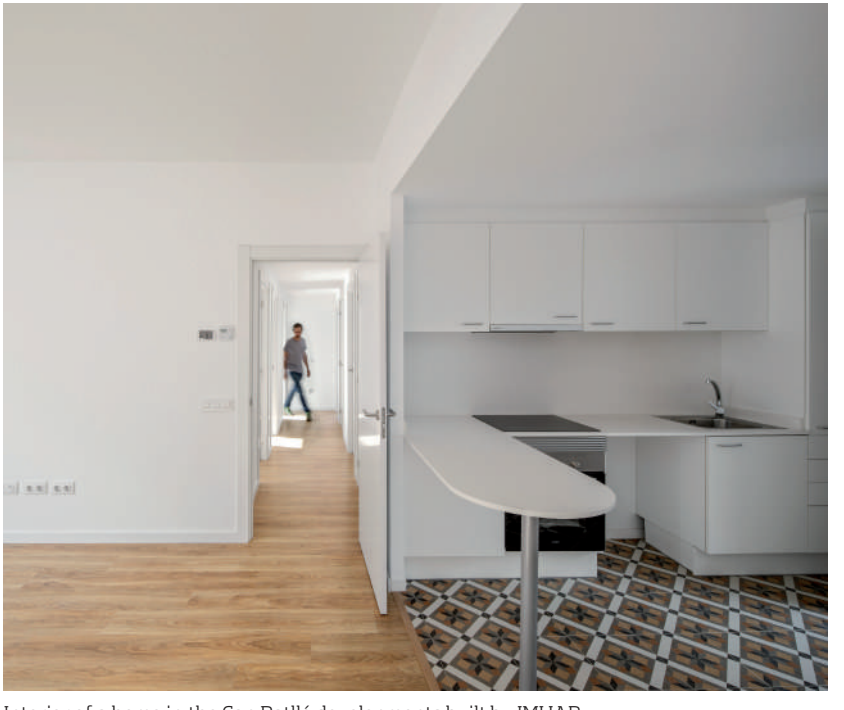
According to their work, which uses the nomenclature previously used by engineer Steven Groák (*The Idea of Building*, 1992)[3], a home is flexible when it can adapt to changing needs and patterns, both social and technological. In a way, he is referring to a home designed to permit physical modifications that will make it suitable for different configurations. On the other hand, by *adaptability* we mean the home's ability to accommodate a variety of social uses. In this case, without making changes to the layout, spaces can be considered to be adaptable when they allow very different functions and uses.

The term *flexibility* would thus be used very specifically to refer to the ability to change the physical configuration of the home. But, in general, we will use the word *flexibility* in a much more open way so as to include both abilities – adaptability too –, although giving priority to the soft concept of flexibility, the concept according to which a user is able to modify the appropriation or use of a space without any technological resources.

In this regard, the wish for flexibility has been found to be one of the qualities most sought after by contemporary architecture. Great masters of modern architecture have included this characteristic – albeit with different strategies – in their designs. And neither is our local tradition of modern collective housing – originally represented by architectural projects as important as those of Francesc Mitjans, Francisco Juan Barba Corsini, Josep Antoni Coderch and Lluís Nadal, for example – a stranger to this desire for flexibility.

Space hierarchies

By including the gender perspective in this approach, the analysis of space hierarchies seeks to detect and raise the profile of situations of inequality, subordination or imbalance in the use of homes by men and women. It is worth remembering that the concept of gender perspective – or gender studies – refers to the category of analysis in which methods for detecting cultural constructions differentiated by



Interior of a home in the Can Batlló developments built by IMHAB.

2. Jeremy Till, Tatjana Schneider (2007). *Flexible Housing*. London: Architectural Press.
3. Steven Groák (1992). *The idea of building: Thought and action in the design and production of buildings*. London: E & FN Spon.

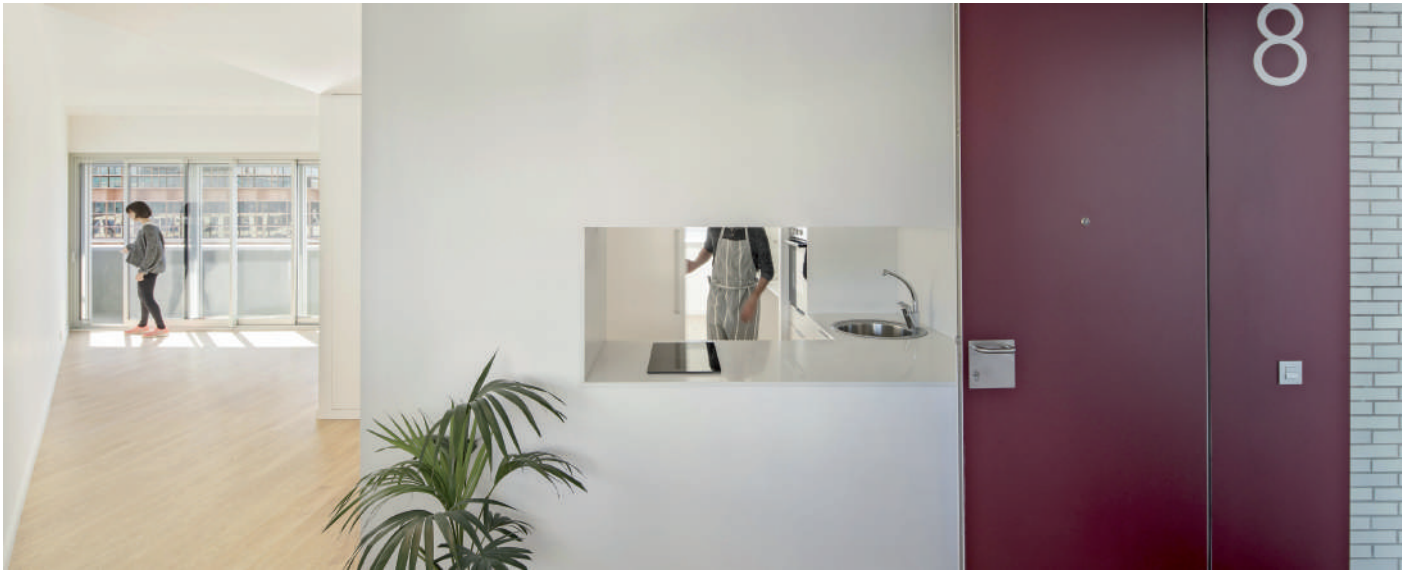
gender are developed. In summary, the aim is to unmask the hierarchies attributed by society to men and women.

In relation to this, the consideration of household tasks as a premise that must be taken into account at the design stage makes it possible to share and make visible certain functions that are erroneously assigned to women in the cultural context of the nuclear family. Achieving equal relationships without gender role conditioning involves identifying these activities and making them more flexible by involving everyone who lives in the home.

Spaces are never neutral, so it is not difficult to show situations of imbalance that can result in hierarchical uses. Bedrooms with a large difference in dimensions, kitchen or laundry spaces that are invisible to passive inhabitants, bathrooms that are tied or restricted to only some inhabitants and housework areas sized for only one person, etc. are typical characteristics of hierarchical homes.

In order to incorporate the gender perspective in housing policies, it is more important than ever to ensure the visibility of every area in which housework is carried out and ensure the participation of all users of the home in those tasks. It must also be taken into account that an exclusively structure-based view of the home could conceal architectural features that might help remove the hierarchy of the home. In a way, although these matters go beyond the scope of the analysis proposed here, the whole building designed – or neighbourhood planned – can include uses and facilities that facilitate equal opportunities from a gender point of view.

We know of some international homes that have really explored the removal of hierarchies. For this reason, we will seek to find those projects



Close view of the kitchen of one of the serviced homes for the elderly in the Glòries development.

that have been carried out either fully or partly on the basis of particular attention to the gender perspective. In summary, the most ambitious aim when designing a building or neighbourhood will be to propose a number of different strategies in order to keep spaces active and obtain an interesting range of degrees of privacy.

Related approach

Equality and flexibility are part of a mutually related approach: a space that is not very flexible will easily lead to a hierarchical use, just like a very hierarchical home is not a very flexible one.

From the point of view of method, in this article the approach to spaces and uses through the concepts of flexibility and hierarchy is carried out through a battery of analytical questions applied to a number of selected projects in order to detect their weak points and positive characteristics. Below are the aspects taken into account and the results of the analysis in projects that can serve as examples. By way of reflection on the graphical analysis, the conditions that can be improved will be indicated in red in each case.

It is worth clarifying that this analysis does not intend to define a closed model of housing. On the contrary, its aim is to virtually inhabit the projects from specific analytical positions in order to detect aspects that can be put into practice from both a configuration and a legislative point of view.

03. Flexibility of spaces and everyday uses

I. FLEXIBILITY OF SPACES

We will start by analysing the spaces that are commonly recognisable in any home. Bedrooms, lounges, kitchens and bathrooms on the inside, and terraces or balconies on the outside, are compartmented areas that predefine some of the functions carried out in them. We will see the great extent to which excessive definition, distinction or compartmentalisation (particularly in cases of small areas) limits a space's capacity for flexibility.

Spaces are never neutral, so it is not difficult to show situations of imbalance that can result in hierarchical uses.

We will then review the conditions that should be analysed in each area and will identify from among the projects under analysis those that best exemplify the qualities sought.

Bedrooms

The number of bedrooms is usually seen as a defining quantitative factor of a home's dimensional capacity, regardless of the capacity (volume or surface area) of the bedrooms themselves. This consideration has resulted in the hierarchical configuration of bedrooms from the habitability regulations themselves (the maximum geometric requirement only applies to one of the bedrooms, which is automatically considered to be the main bedroom, thus favouring hierarchies inside the home). In spite of this, it would be more appropriate when defining these spaces to look at the number of people or inhabitants that compose the shared-living group and seek to avoid small rooms that preclude changes in use and appropriation.

From the point of view of a flexible appropriation of spaces, and considering that a bed can be as much as 2 metres long, we should define bedrooms based on the possibility of changing the layout of the furniture. Thus, a bedroom that is optimised from a flexibility point of view should have a minimum clear space of 2.8 x 2.8 metres and a minimum width of 0.8 metres between the bed and the dividing wall. This in no way means that this minimum surface area is enough. However, if you include a clear space of these dimensions, you guarantee the possibility of using the bedroom with the bed in at least two different orientations.

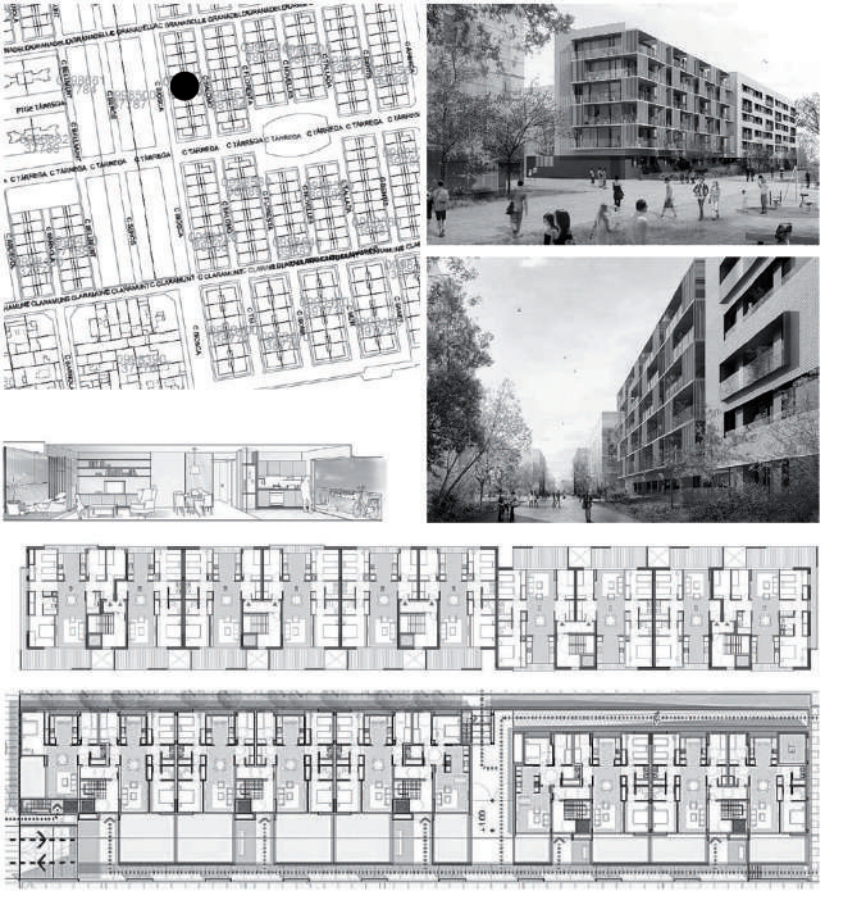
On the other hand, in order to minimise

hierarchies and facilitate the interchangeability of uses and users as well as the appropriation of spaces by new arrivals, there should no significant differences in size between bedrooms. Finally, maximum neutrality can be achieved by planning all the bedrooms with equivalent quality conditions in terms of lighting, orientation and ventilation, etc.

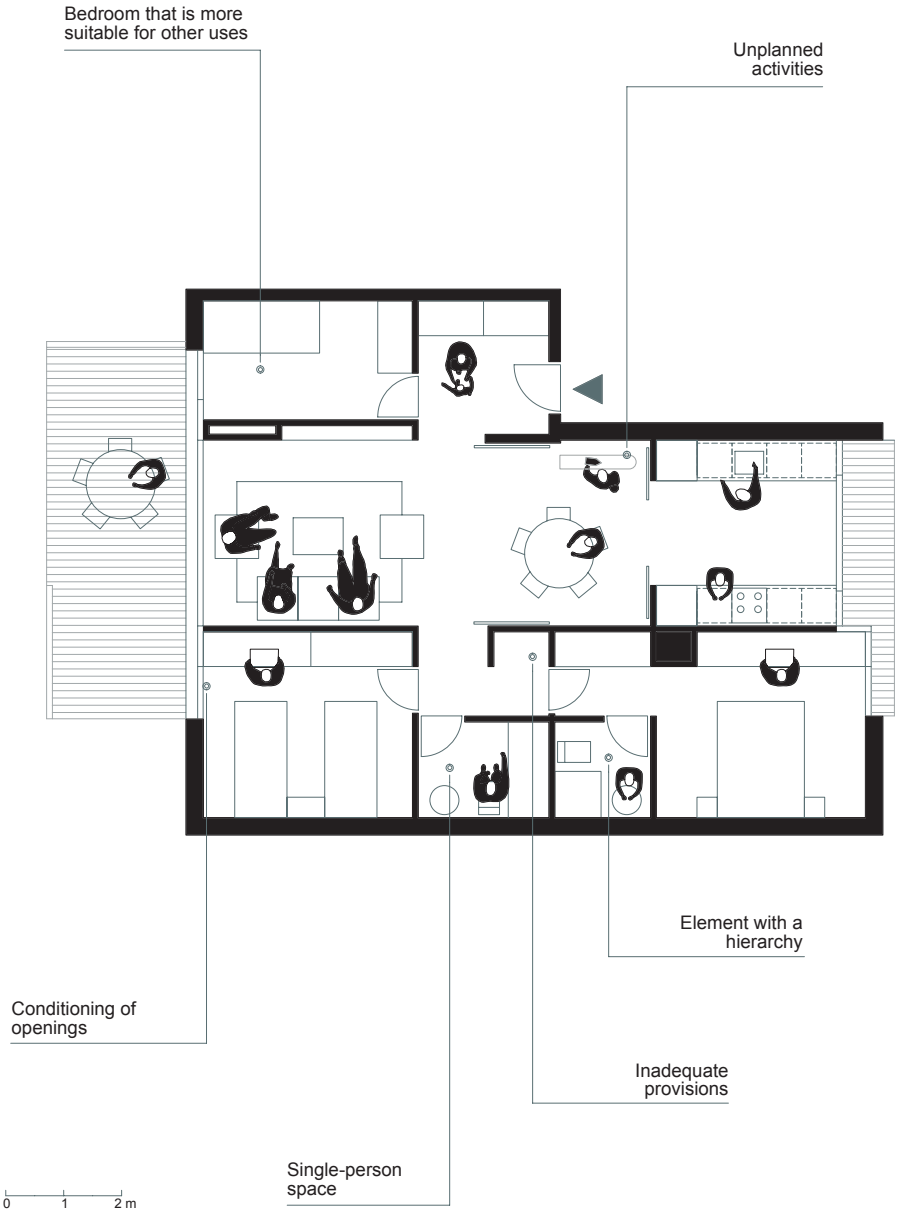
In view of all this, we propose an analysis of the clear dimensions of spaces and their flexibility when occupying them, in order to establish the dimensional hierarchies that affect housing.

One of the projects that best treats bedrooms as flexible areas is Building G2 of Phase IV of the Bon Pastor development. Here, the TAC architectural team (Eduard Gascón) proposes two bedrooms that are almost equivalent as regards surface area and conditions and which can fit a circumference of 3.2 metres. In fact, the home in question has a third bedroom, but one that is clearly differentiated in order to encourage other uses.

Bon Pastor Phase IV - Building G2
60 homes for people affected by urban development
Architects: TAC (Eduard Gascón)



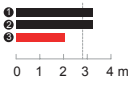
Configuration

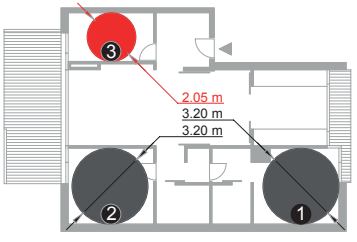


Flexibility of spaces

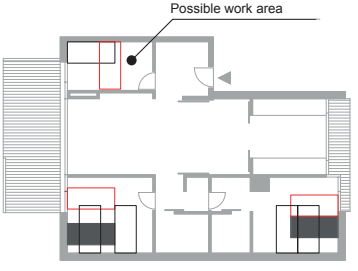
1 Bedrooms

Dimensional hierarchies





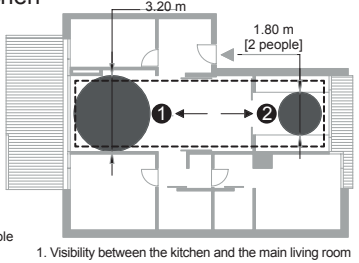
1. Clear dimension



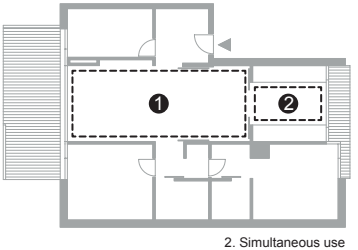
2. Flexibility of occupation

2 Lounge / Kitchen

- Lounge/kitchen visibility
- Simultaneous uses
- Central nature of the whole



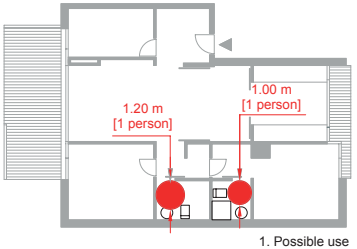
1. Visibility between the kitchen and the main living room



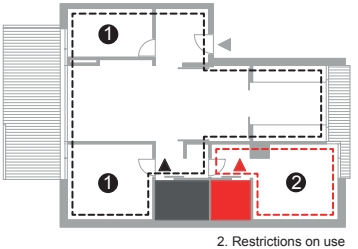
2. Simultaneous use

3 Bathrooms

- Simultaneous use [1 compartmented bathroom]
- Simultaneous use [double bathroom]
- Care use
- Non-hierarchical use



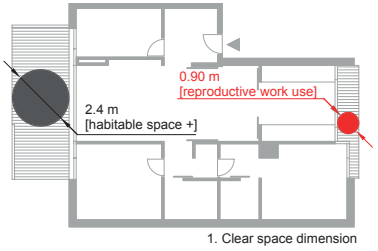
1. Possible use



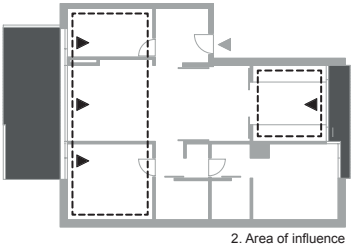
2. Restrictions on use

4 Balconies / Terraces

- Habitable space use
- Storage use
- Reproductive work use



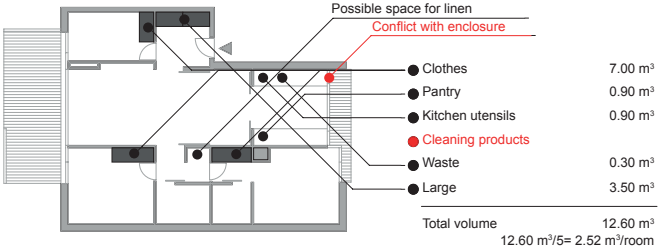
1. Clear space dimension



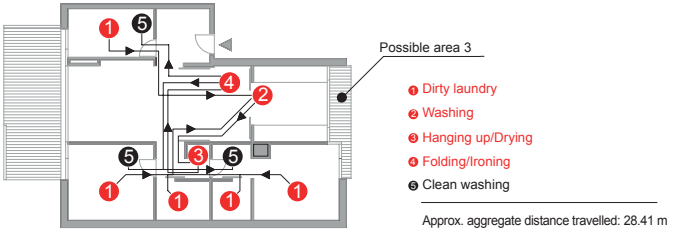
2. Area of influence

Everyday uses

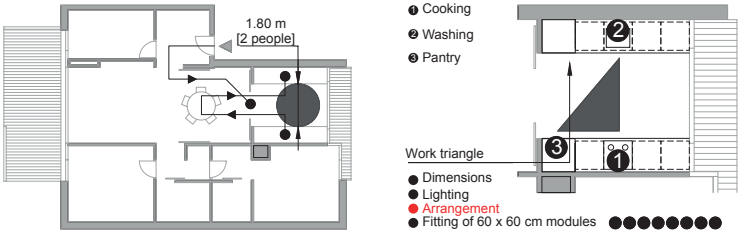
1 Storage



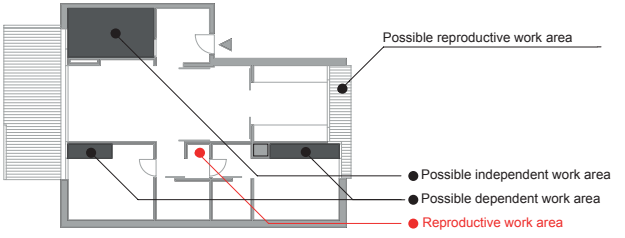
2 Laundry cycle



3 Food axis



4 Work spaces



Lounge / Kitchen

The main living room of the home is the space with the greatest size requirements under the current habitability legislation. It can be considered to be the area that is shared by everyone who lives there and, therefore, the place where a number of leisure-related options converge, but work activities (housework or other), which can be carried out at the same time, also take place here.

The kitchen, on the other hand, is the home's most specialised living space. It is a functional place, designed for carrying out all the tasks relating to the food axis, and is therefore a work area that requires a set of specific conditions.

The connection between the main living room (lounge/dining room) and the kitchen increases the visibility of the tasks carried out in the kitchen, prevents the person who carries them out from being excluded or discriminated against and fosters involvement by the other inhabitants.

On the other hand, when the lounge and the kitchen are integrated in a single area, there is a risk of interfering with the rest or leisure of the people who are most involved in kitchen tasks, for whom these tasks would be always visible. For this reason, we recommend an integration that can be modulated, allowing simultaneous uses and visibility of the work but also ensuring that users can rest.

One last factor to take into account is the central nature of the whole and its integration with the rest of the home, with different configurations so as to promote visibility and shared participation in its uses, parental control and even communication with outside spaces.

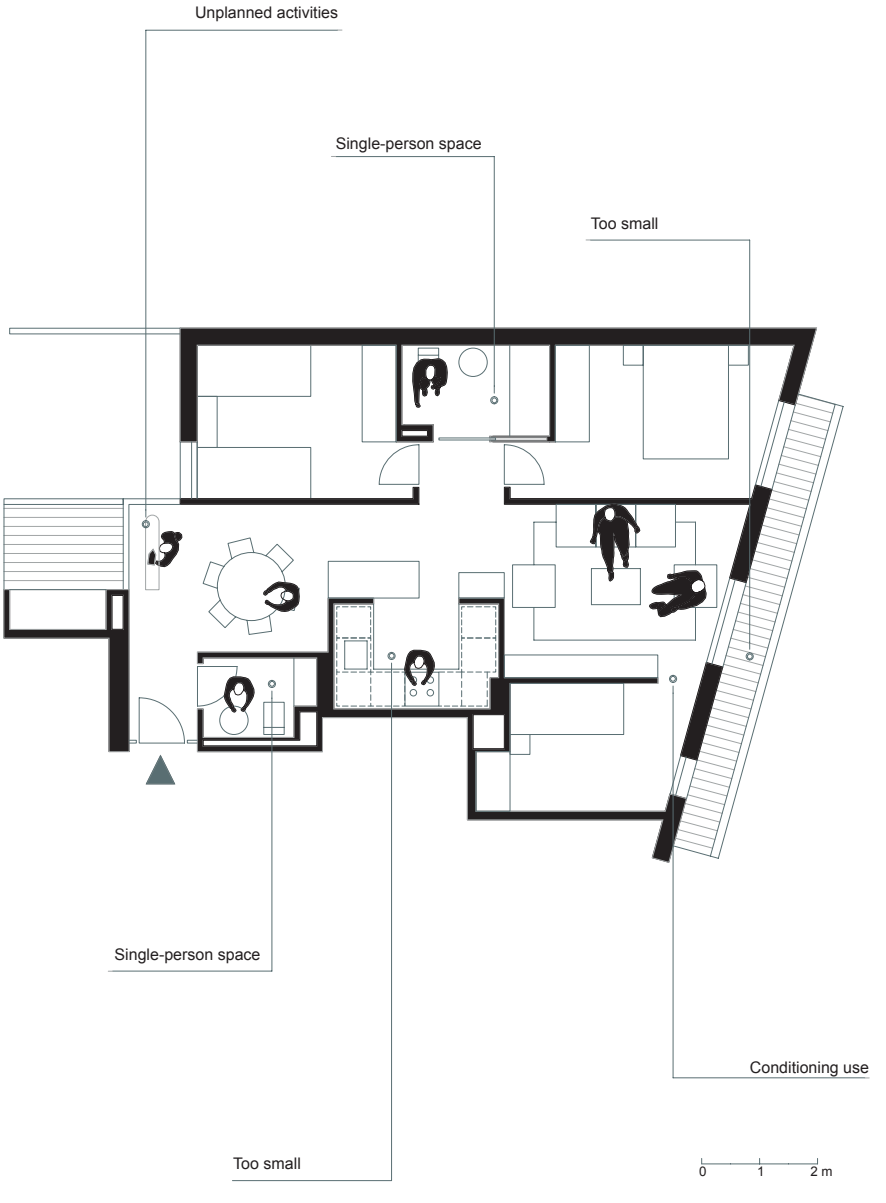
It is precisely this centrality that was beautifully achieved in Esteve Terrades' Via Augusta 401-403 project. The proposed configuration does not just involve the kitchen occupying the central space of the home: the way the dining room and the lounge are placed in relation to each other promotes maximum adaptability for relationships.

Via Augusta - Via Augusta, 401-403

13 homes for people affected by urban development

Architect: Esteve Terrades

Configuration

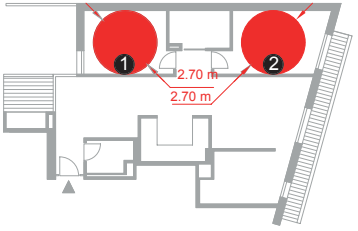


Flexibility of spaces

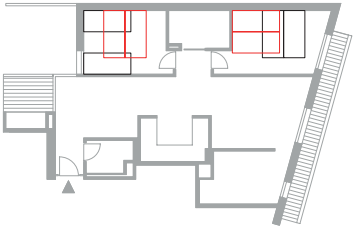
1 Bedrooms

Dimensional hierarchies

0 1 2 3 4 m



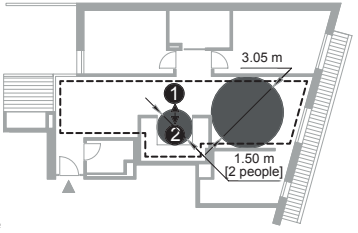
1. Clear space dimension



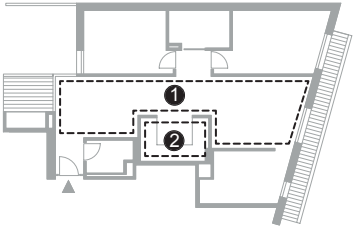
2. Flexibility of occupation

2 Lounge / Kitchen

- Lounge/kitchen visibility
- Simultaneous uses
- Central nature of the whole



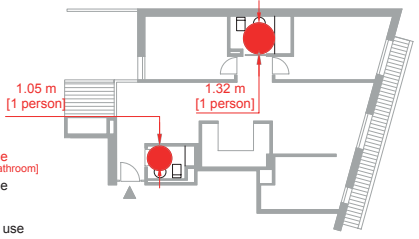
1. Visibility between the kitchen and the main living room



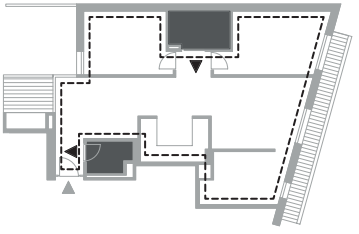
2. Simultaneous use

3 Bathrooms

- Simultaneous use [1 compartmented bathroom]
- Simultaneous use [double bathroom]
- Care use
- Non-hierarchical use



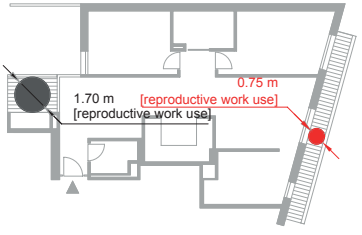
1. Possible use



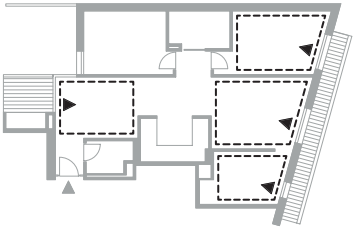
2. Restrictions on use

4 Balconies / Terraces

- Habitable space use
- Storage use
- Reproductive work use



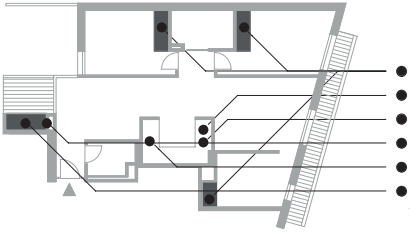
1. Clear space dimension



2. Area of influence

Everyday uses

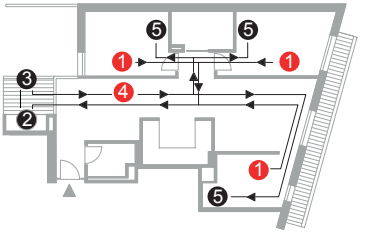
1 Storage



- Clothes 5.60 m³
- Pantry 0.90 m³
- Kitchen utensils 0.60 m³
- Cleaning products 0.30 m³
- Waste 0.30 m³
- Large 2.50 m³

Total volume 10.20 m³
10.20 m³/5= 2.55 m³/room

2 Laundry cycle

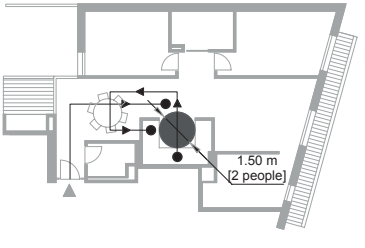


Possible area 3

❶ Dirty laundry
❷ Washing
❸ Hanging up/Drying
❹ Folding/Ironing
❺ Clean washing

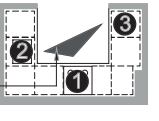
Approx. aggregate distance travelled:28.40 m

3 Food axis



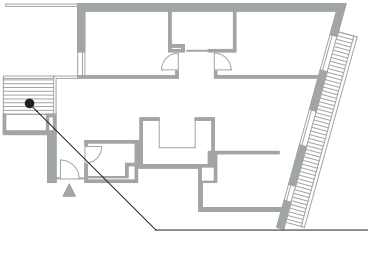
❶ Cooking
❷ Washing
❸ Pantry

Work triangle



- Dimensions
- Lighting
- Arrangement
- Fitting of 60 x 60 cm modules

4 Work spaces



- Possible independent work area
- Possible dependent work area
- Reproductive work area

Bathrooms

These too are clearly specialised areas whose regulation is practically restricted to the numerical definition of the hygiene-related devices included in them. However, bathroom layout can seriously influence the functionality of the home as a whole. The case that provides the clearest example of this is that of homes with two bathrooms of which one is *en-suite*. This inclusion of an *en-suite* bathroom clearly creates a hierarchy between bedrooms and leads to unequal occupation by the shared-living group.

For this reason, an analysis of the bathrooms leads to the conclusion that there are restrictions on their use by the inhabitants, which are usually caused by hierarchical layouts.

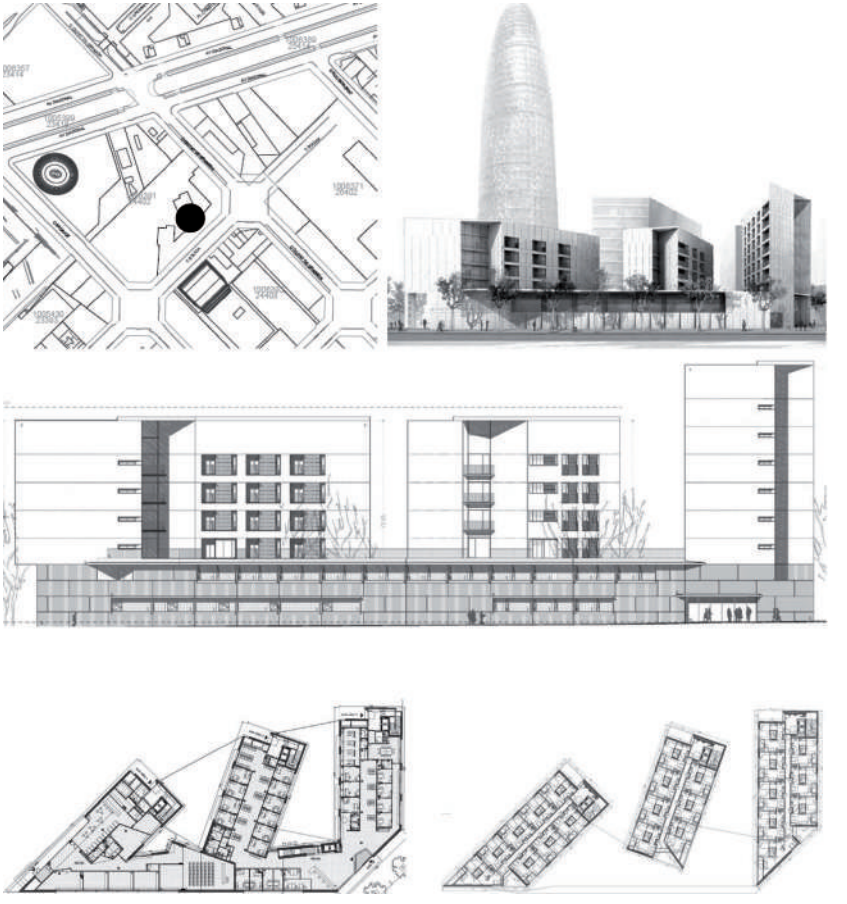
On the other hand, the bathrooms available must be related to the capacity of the home as a whole, taking into account that the simultaneous use of such facilities must always be possible. An efficient way to achieve this is by having separate bathrooms for different uses, permitting their simultaneous use without having to fully duplicate the equipment.

Finally, we must also take into account the size of bathrooms, which must fit more than one person in order to assist children or the elderly or for other situations.

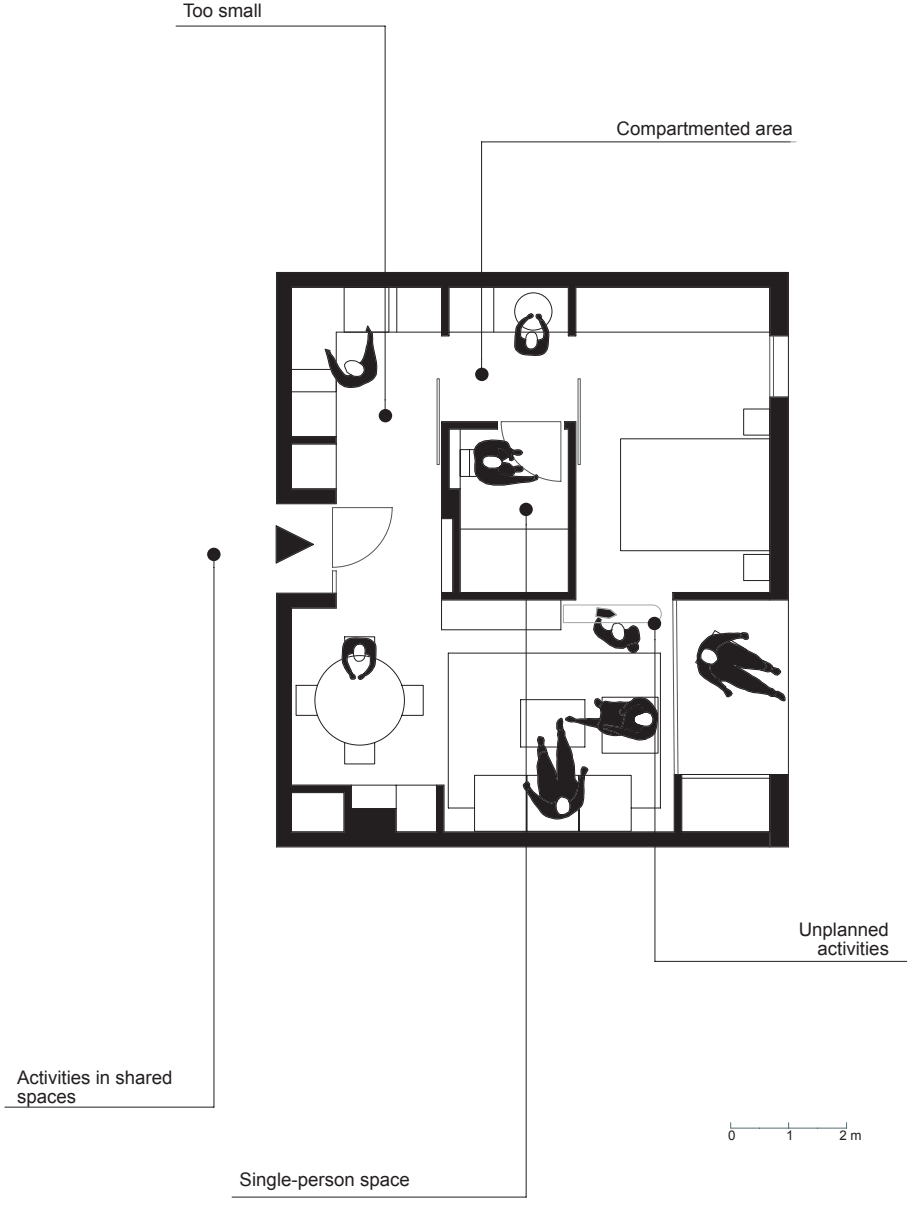
It is no coincidence that the configurations of institutional homes provided by the Barcelona Municipal Institute of Housing and Renovation often provide the best solutions to the conditions analysed here. Although these homes are small, the solutions designed usually aim to achieve maximum versatility and capacity for the provision of assistance in bathrooms. For example, the Glòries/Ciutat de Granada project by Esteve Bonell, Josep Maria Gil, Marta Peris and José Toral includes a central toilet sized for the provision of assistance and a sink outside that can be used at the same time.

Glòries Phase I - Carrer Ciutat de Granada, 147, 151 and 155

105 institutional homes for the elderly, primary healthcare centre
Mental Health Centre and Cultural Centre for the Elderly
Architects: Esteve Bonell, Josep M. Gil, Marta Peris and José Toral



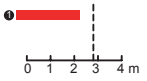
Configuration

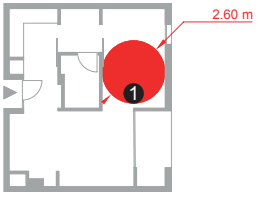


Flexibility of spaces

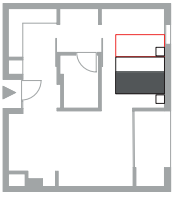
1 Bedrooms

Dimensional hierarchies





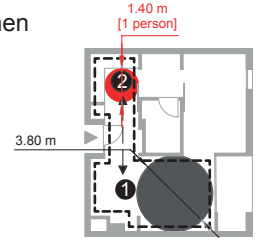
1. Clear space dimension



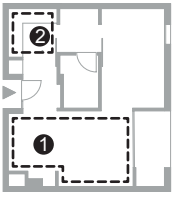
2. Flexibility of occupation

2 Lounge / Kitchen

- Lounge/kitchen visibility
- Simultaneous uses
- Central nature of the whole



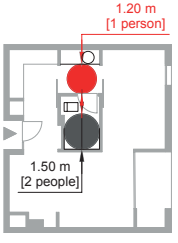
1. Visibility between the kitchen and the main living room



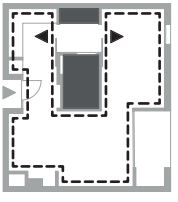
2. Simultaneous use

3 Bathrooms

- Simultaneous use [1 compartmented bathroom]
- Simultaneous use [double bathroom]
- Care use
- Non-hierarchical use



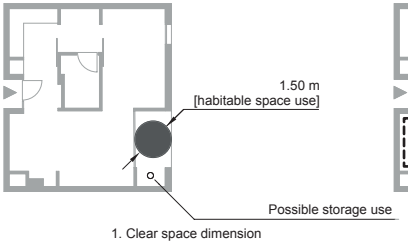
1. Possible use



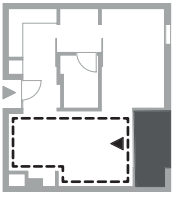
2. Restrictions on use

4 Balconies / Terraces

- Habitable space use
- Storage use
- Reproductive work use



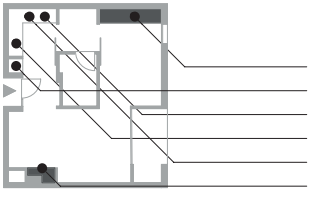
1. Clear space dimension



2. Area of influence

Everyday uses

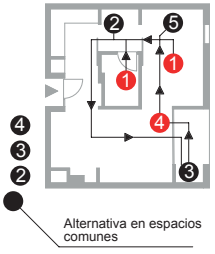
1 Storage



Clothes	3.90 m³
Pantry	0.90 m³
Kitchen utensils	0.90 m³
Cleaning products	0.30 m³
Waste	0.30 m³
Large	1.30 m³
Total volume	7.60m³

7.60 m³/2= 3.80 m³/room

2 Laundry cycle

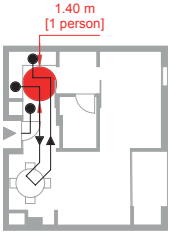


Possible area 3

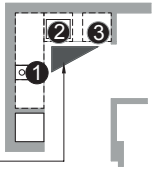
1. Dirty laundry
2. Washing
3. Hanging up/Drying
4. Folding/Ironing
5. Clean washing

Approx. aggregate distance travelled:20.00 m

3 Food axis



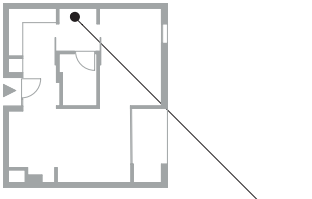
1. Cooking
2. Washing
3. Pantry



Work triangle

- Dimensions
- Lighting
- Arrangement
- Fitting of 60 x 60 cm modules

4 Work spaces



- Possible independent work area
- Possible dependent work area
- Reproductive work area

Balconies / Terraces

We can also expressly look at the parts of homes that are most related to the outside environment. Balconies, terraces and galleries, among others, are intermediate spaces that connect the private activities of the home to the public circumstances of a place. They encourage the socialisation of the group of inhabitants on the one hand and spatial identification on the other. These are usually also spaces that facilitate the regulation of temperature in the home by means of shade, double glazing or other options.

In particular, the external spaces enjoy functional characteristics of indeterminate function that make them particularly suitable for flexible use. There are many possibilities, although they are mainly conditioned by their dimensions.

An outside area that allows for comfortable occupation by more than one person (the size of these spaces usually starts at 1.5 metres) can be occupied as a living space that can be used to supplement the indoor spaces. For anything smaller, possible uses relating to the laundry cycle (spaces for hanging up washing outdoors, sorting or storage spaces, etc.) can be considered. Even so, in such cases we recommend that they should be linked to a specific laundry area, something that is only very rarely proposed.

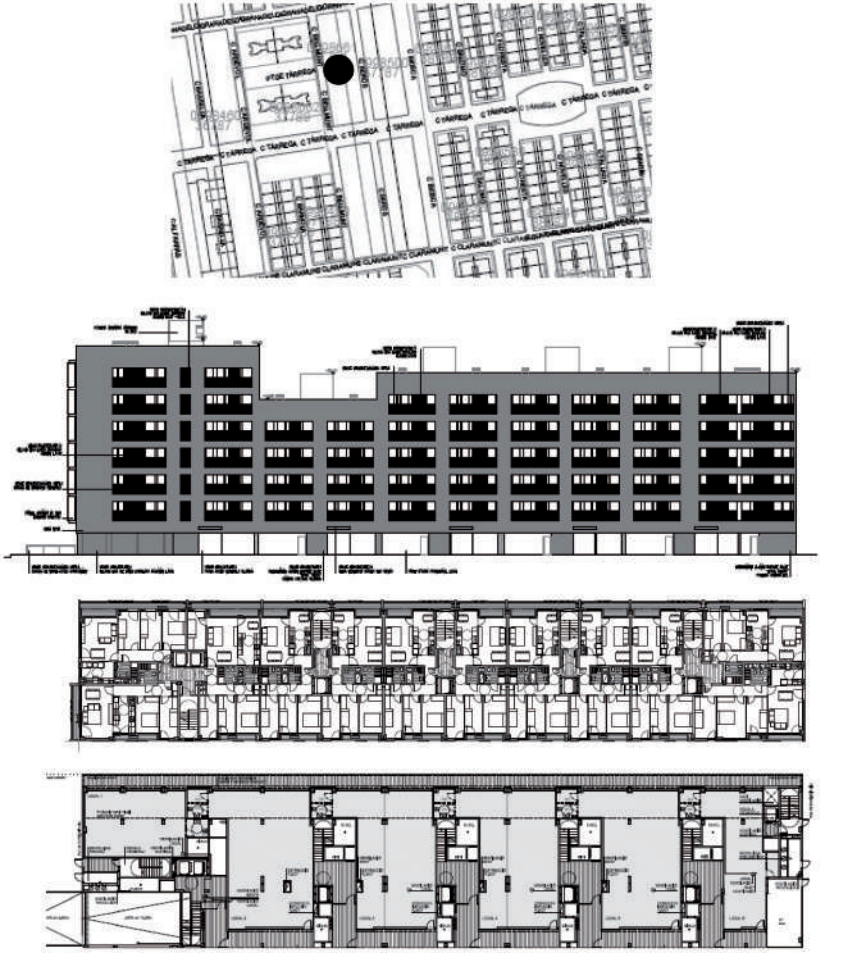
In summary, outside spaces belonging to the home are analysed according to their functional capabilities and the areas of influence of the home that benefit from these additional spaces.

These outdoor spaces are very well dealt with in Joan Pascual's and Ramon Ausió's project for Building F1 of Phase III of the Bon Pastor development. Here, the architects work with various terrace formats and always qualify their dimensions and characteristics. The desire to use terraces for functions relating to the home's indoor areas is identified.

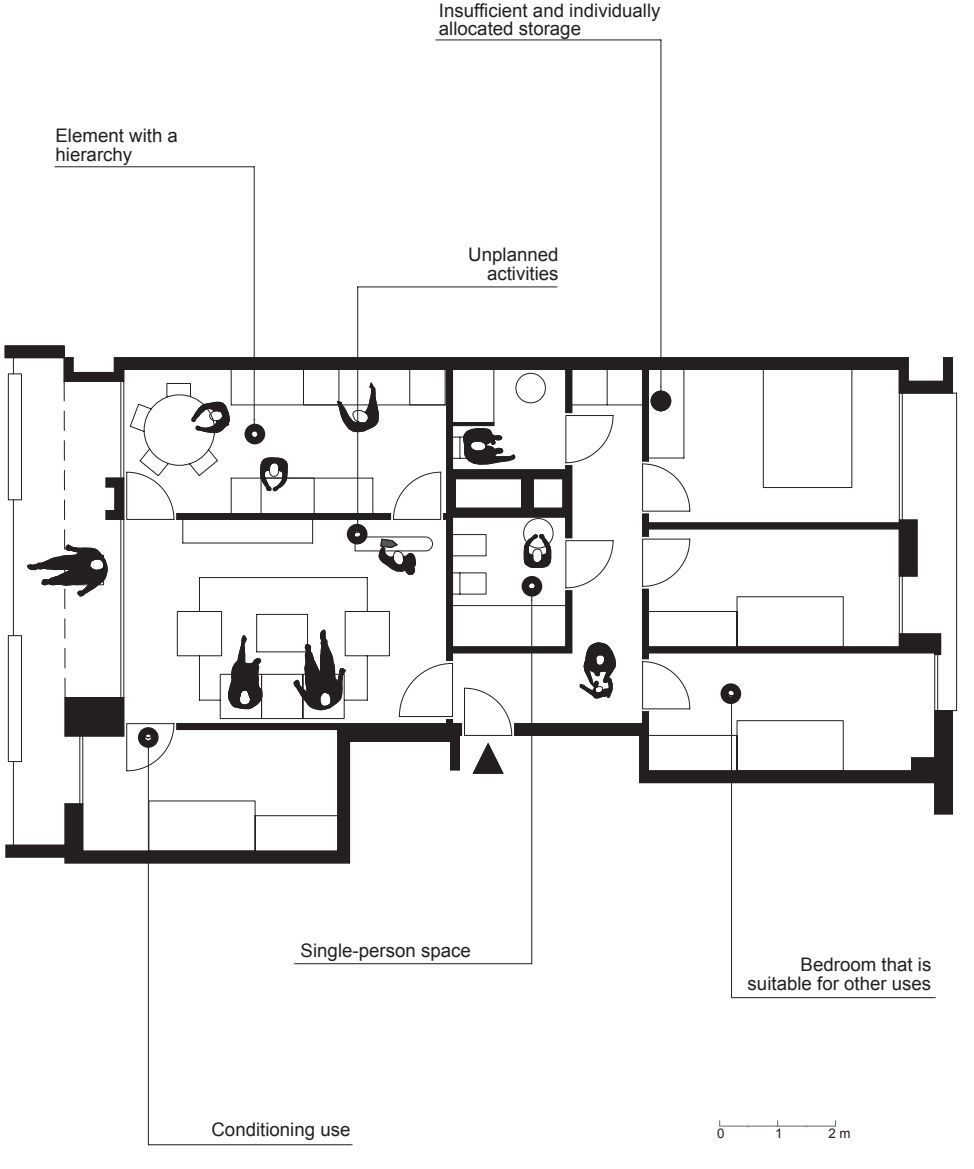
Bon Pastor Phase III - Building F1 - Carrer Biosca, 17-25

61 homes for people affected by urban development

Architects: Joan Pascual and Ramon Ausió



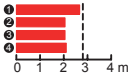
Configuration

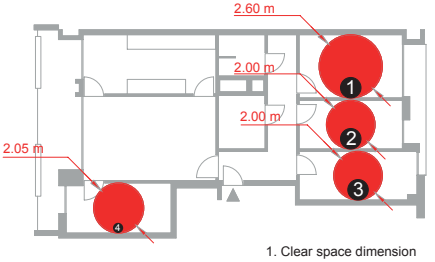


Flexibility of spaces

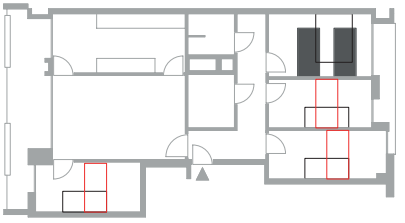
1 Bedrooms

Dimensional hierarchies





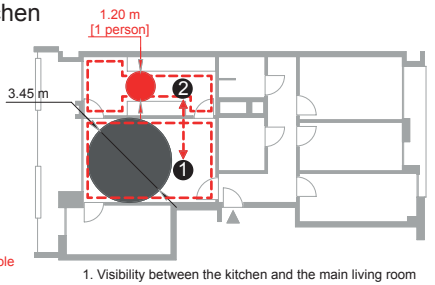
1. Clear space dimension



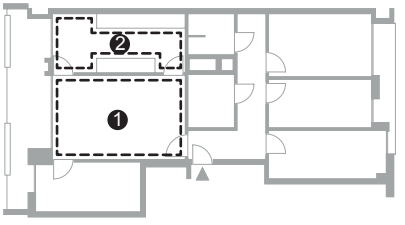
2. Flexibility of occupation

2 Lounge / Kitchen

- Lounge/kitchen visibility
- Simultaneous uses
- Central nature of the whole



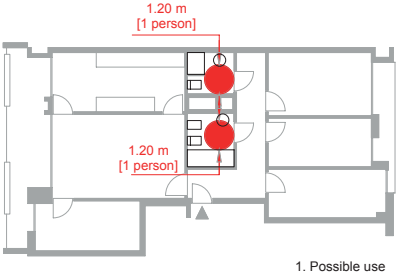
1. Visibility between the kitchen and the main living room



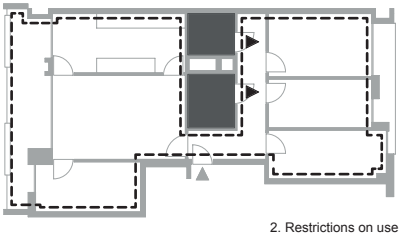
2. Simultaneous use

3 Bathrooms

- Simultaneous use [1 compartmented bathroom]
- Simultaneous use [double bathroom]
- Care use
- Non-hierarchical use



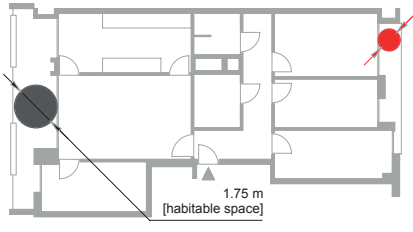
1. Possible use



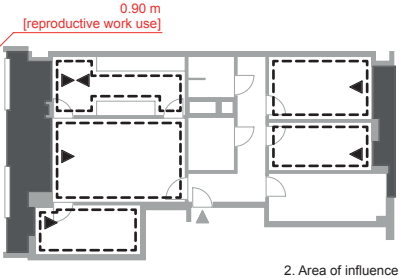
2. Restrictions on use

4 Balconies / Terraces

- Habitable space use
- Storage use
- Reproductive work use



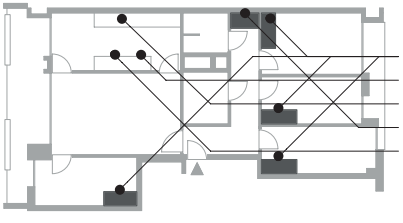
1. Clear space dimension



2. Area of influence

Everyday uses

1 Storage

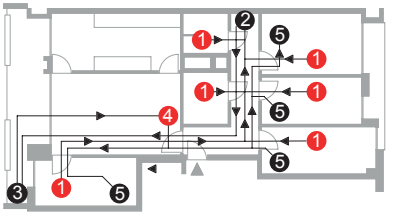


- Clothes 4.80 m³
- Pantry 0.90 m³
- Kitchen utensils 0.90 m³
- Cleaning products 0.90 m³
- Waste 0.30 m³
- Large

Total volume 7.80 m³

7.80m³/5= 1.56m³/room

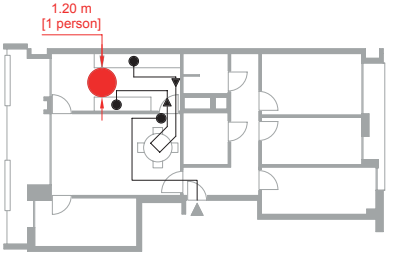
2 Laundry cycle

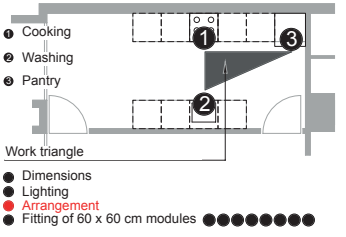


1. Dirty laundry
2. Washing
3. Hanging up/Drying
4. Folding/Ironing
5. Clean washing

Approx. aggregate distance travelled:39.63 m

3 Food axis



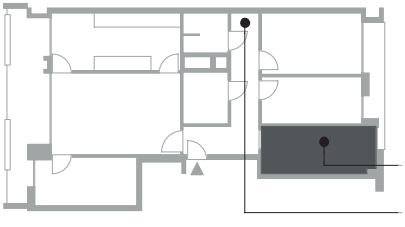


1. Cooking
2. Washing
3. Pantry

Work triangle

- Dimensions
- Lighting
- Arrangement
- Fitting of 60 x 60 cm modules

4 Work spaces



- Possible independent work area
- Possible dependent work area
- Reproductive work area

II. EVERYDAY USES

In the same way as spaces, the uses and functions carried out in the home affect its flexibility. This is due to the failure to allocate specific areas to daily tasks. The main consequence of this is having to use some spaces for unforeseen activities, causing them to lose flexibility and the ability to adapt them to other uses due to the need to include unplanned activities with suitable quality and visibility conditions.

Storage, the functions of the laundry and food cycles and work at home (including productive and other work) must be considered so as to increase the flexibility of the home.

As in the previous case, we will look at these functions and illustrate them with some of the projects under analysis.

Storage

One of the best known 'ideal homes' conceived by British architects Alison and Peter Smithson was the 'Everything in its Place' house[4], designed in response to the excessive domestic consumption of the 1990s. The architect team proposed the need to reorganise conventional homes to make room for the various types of storage space needed at the time. According to their work, brooms, party dresses, a set of chairs, a workbench, a scooter, a folding ladder, tools, a bicycle, curtains, tablecloths, an old pram, a folding bed, luggage, shelves, towels, shoes and clothing can take up 22% of the total volume of a house. This accumulation undoubtedly keeps growing, although regulatory requirements still consider storage as a minor function of rooms.

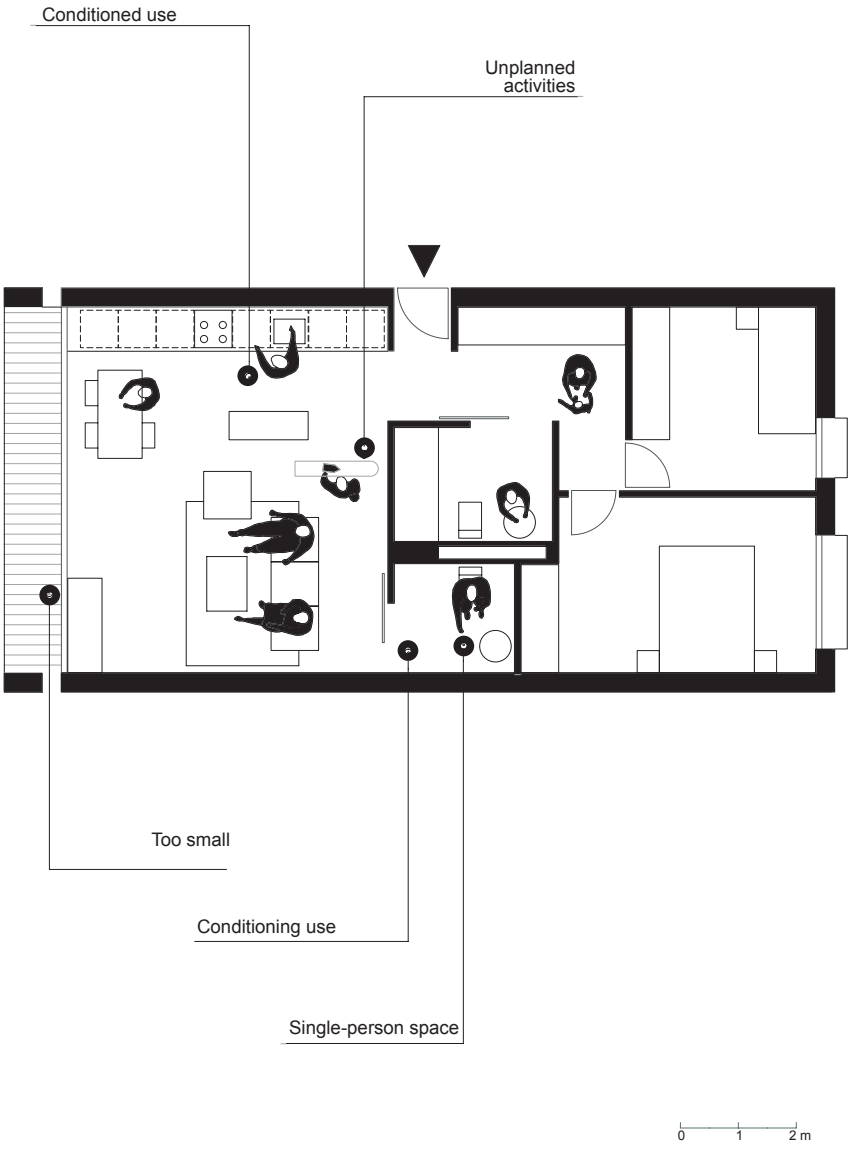
The fact that things are stored mainly in bedrooms is not a positive aspect, as it reduces the flexibility of their occupation and even of daily activities. Neither is it recommended from a health point of view to sleep next to storage spaces, as they have been identified as possible sources of allergies. For this reason, storage spaces should always be in the shared areas of the home.

Bon Pastor Phase IV - Building H1

42 homes for people affected by urban development
Architects: Alonso, Balaguer, Riera i Arquitectes Associats

4. Dirk van den Heuvel, Max Risselada (2007). *Alison and Peter Smithson. From the House of the Future to a house of today.* Barcelona: Polígrafa.

Configuration



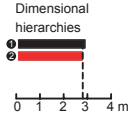
By observing the activities that usually take place at home, we can identify the main types of storage required, although subject to adding large spaces or storage rooms that can be used for any kind of storage.

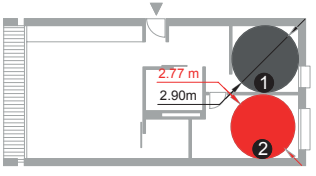
Without reaching the percentage suggested by the Smithson's, in order to carry out this analysis we have assumed that each inhabitant could need a minimum of approximately 2.5 cubic metres for storage, spread out among the various areas based on function.

A good example of planned storage can be seen in the project for Building H1 of Phase IV of the Bon Pastor development designed by Alonso, Balaguer, Riera i Arquitectes Associats. This project envisages a large storage space located in a shared and central area of the home, near the entrance. The amount of storage space is supplemented by wardrobes in the bedrooms and over four metres of kitchen cupboards. It is easy to see how this amount of storage space makes it easier to distribute and store things.

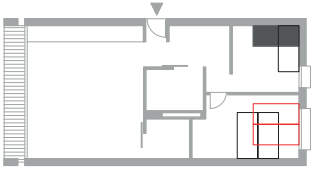
Flexibility of spaces

1 Bedrooms





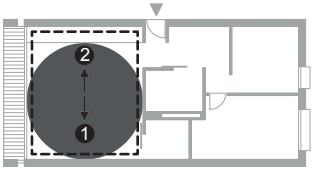
1. Clear space dimension



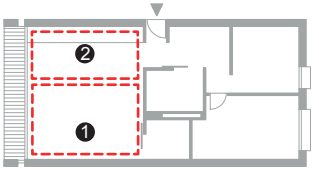
2. Flexibility of occupation

2 Lounge / Kitchen

- Lounge/kitchen visibility
- Simultaneous uses
- Central nature of the whole



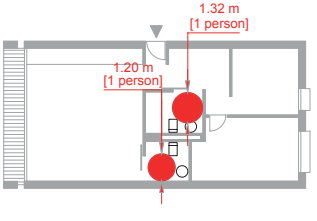
1. Visibility between the kitchen and the main living room



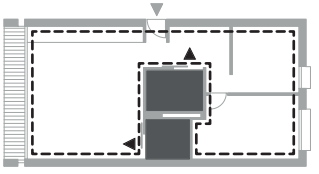
2. Simultaneous use

3 Bathrooms

- Simultaneous use [1 compartmented bathroom]
- Simultaneous use [double bathroom]
- Care use
- Non-hierarchical use



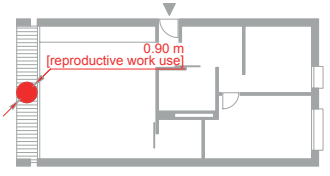
1. Possible use



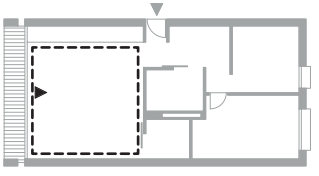
2. Restrictions on use

4 Balconies / Terraces

- Habitable space use
- Storage use
- Reproductive work use



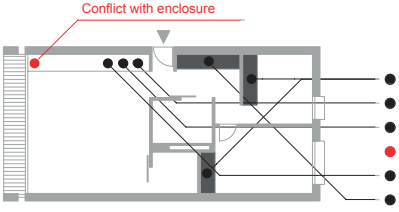
1. Clear space dimension



2. Area of influence

Everyday uses

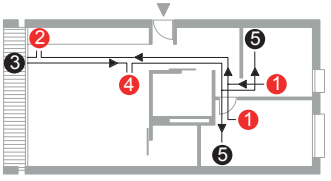
1 Storage



- Clothes 4.74 m³
- Pantry 0.90 m³
- Kitchen utensils 0.90 m³
- Cleaning products
- Waste 0.30 m³
- Large 3.34 m³

Total volume 10.18m³
10.18 m³/3= 3.39m³/room

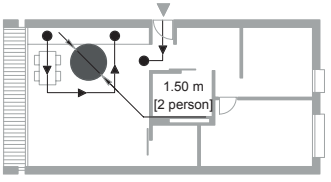
2 Laundry cycle

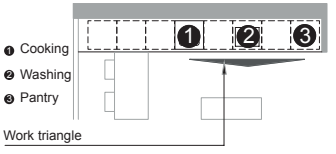


❶ Dirty laundry
❷ Washing
❸ Hanging up/Drying
❹ Folding/Ironing
❺ Clean washing

Approx. aggregate distance travelled:20.65 m

3 Food axis



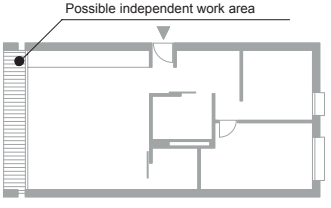


❶ Cooking
❷ Washing
❸ Pantry

Work triangle

- Dimensions
- Lighting
- Arrangement
- Fitting of 60 x 60 cm modules ●●●●●

4 Work spaces



- Possible independent work area
- Possible dependent work area
- Reproductive work area

The laundry cycle

The laundry chain or cycle is the set of stages and functions involved in the management of clothing, including garments, linen and home textiles. Together with the food axis, it can be considered one of the most important sets of household tasks linked to the home. However, many of the activities involved occupy residual spaces and are not adequately provided for.

From a legislative point of view, the habitability decree includes not just storage spaces but also spaces for washing and drying clothes. However, a specific allocation of space is not required, which usually means that these activities are not prioritised when designing home configurations.

The laundry cycle involves a variety of moments, functions and spaces in the home: from storing dirty laundry to folding, ironing and putting away clean clothes, with the washing and drying stages in between. Various spaces for storing clothes, open areas for drying them outdoors, laundry areas to minimise the routes taken and increase efficiency, and spaces envisaged for ironing or for clothing maintenance work are some of the needs that are rarely fully covered.

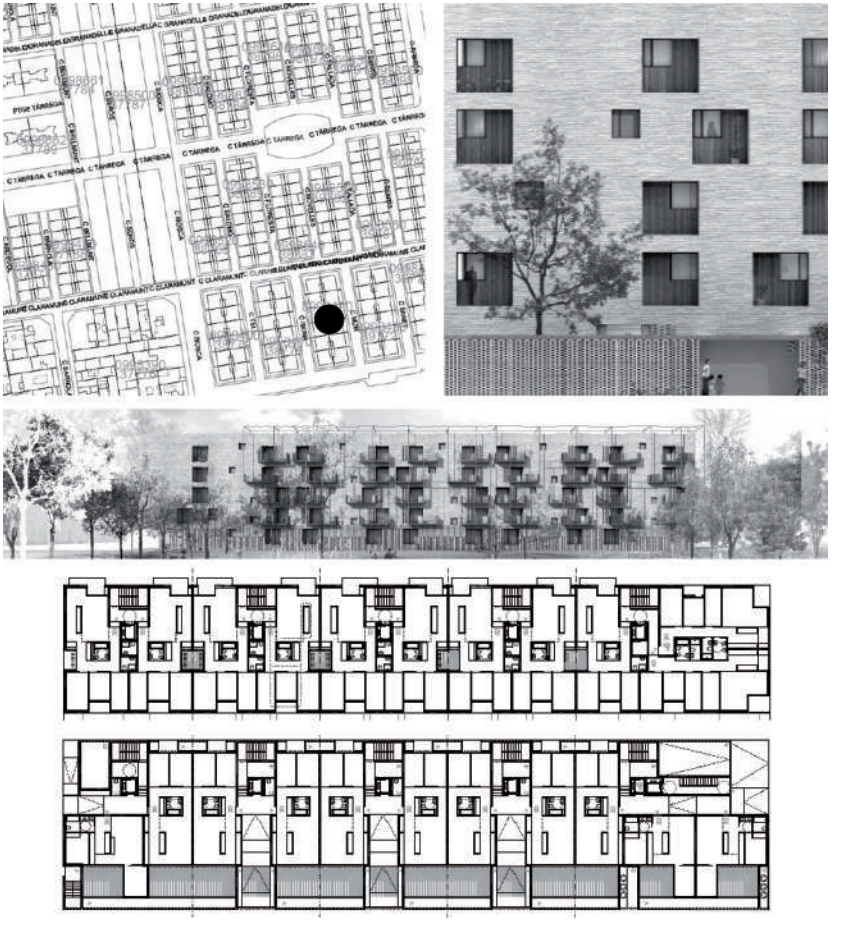
The analysis aims to identify these failings and interpret the possible solutions in each case.

In fact, from among the projects analysed, no proposal that could be considered fully exemplary in meeting all the needs identified was found. However, what we *can* do is identify a few examples in which some spaces for clothing-related tasks have been taken into account. This is the case of Building L1 of Phase IV of the Bon Pastor development, where the Peris, Toral i Eletresjota Técnics Associados team has provided enough spaces to carry out the tasks included in this cycle.

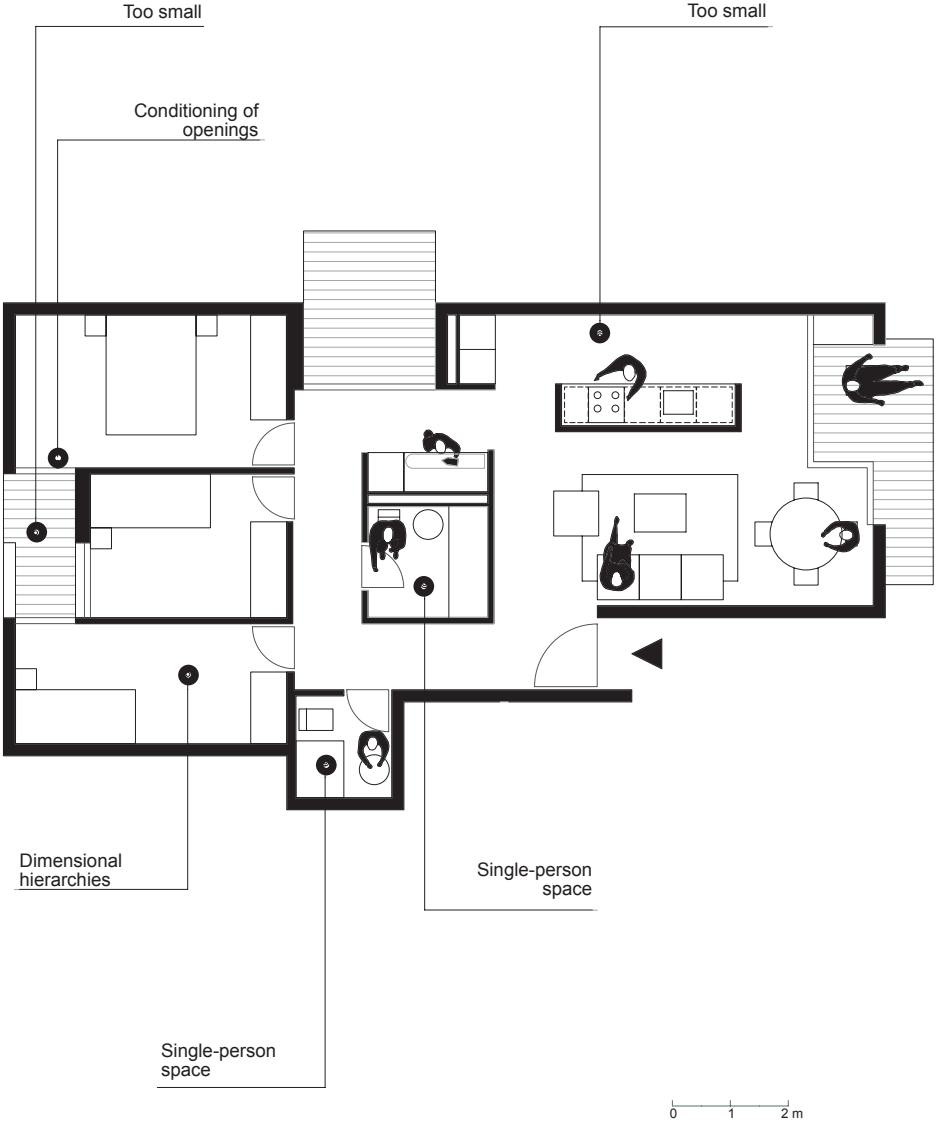
Bon Pastor Phase IV - Building l1

55 homes for people affected by urban development

Architects: Peris, Toral i Eletresjota Tècnics Associats



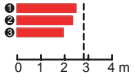
Configuration

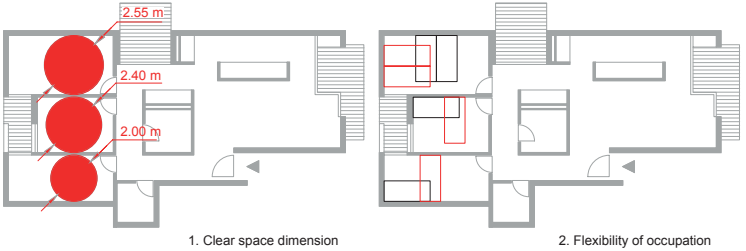


Flexibility of spaces

1 Bedrooms

Dimensional hierarchies



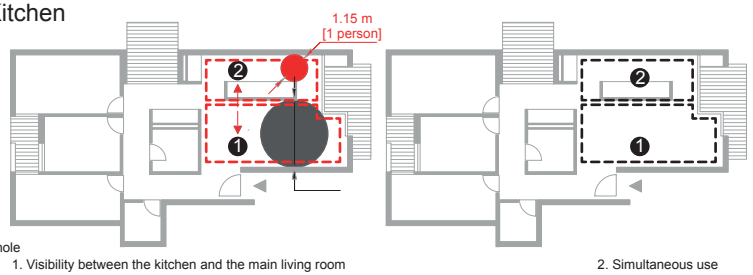


1. Clear space dimension

2. Flexibility of occupation

2 Lounge / Kitchen

- Lounge/kitchen visibility
- Simultaneous uses
- Central nature of the whole

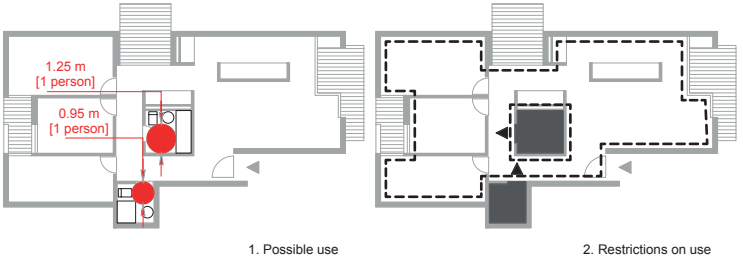


1. Visibility between the kitchen and the main living room

2. Simultaneous use

3 Bathrooms

- Simultaneous use [1 compartmented bathroom]
- Simultaneous use [double bathroom]
- Care use
- Non-hierarchical use

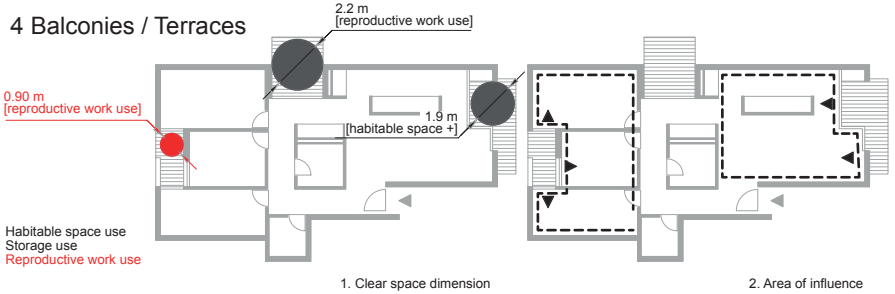


1. Possible use

2. Restrictions on use

4 Balconies / Terraces

- Habitable space use
- Storage use
- Reproductive work use

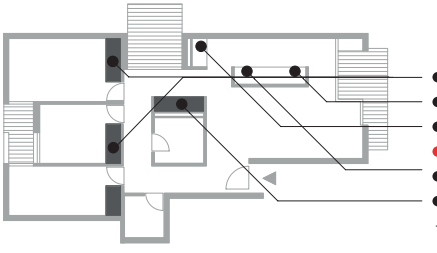


1. Clear space dimension

2. Area of influence

Everyday uses

1 Storage

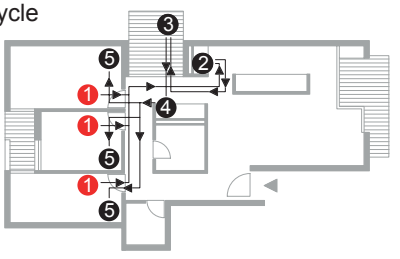


- Clothes 5.76 m³
- Pantry 0.90 m³
- Kitchen utensils 0.90 m³
- Cleaning products
- Waste 0.30 m³
- Large 3.00 m³

Total volume 10.86m³

10.86m³/5= 2.17m³/room

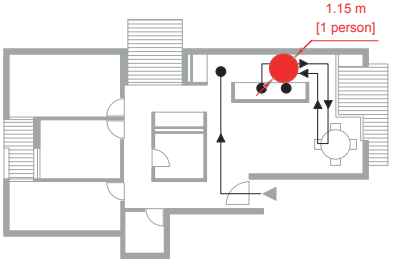
2 Laundry cycle



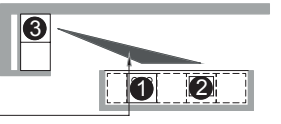
❶ Dirty laundry
❷ Washing
❸ Hanging up/Drying
❹ Folding/Ironing
❺ Clean washing

Approx. aggregate distance travelled:20.20 m

3 Food axis



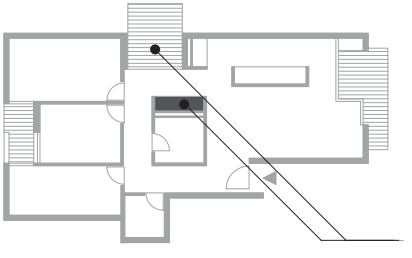
❶ Cooking
❷ Washing
❸ Pantry



Work triangle

- Dimensions
- Lighting
- Arrangement
- Fitting of 60 x 60 cm modules

4 Work spaces



- Possible independent work area
- Possible dependent work area
- Reproductive work area

Food

As discussed above, the food axis identifies the other system of housework-related functions with the most significant daily implications in the home. This term, which is translated from the concept analysed by American professor Elizabeth Collins Cromley ('the food axis') [5], identifies the spaces and activities relating to food at home.

As in the previous case, the route taken by food in the home involves a variety of moments, functions and spaces which usually revolve around the kitchen area. In this case, as this space is covered by specific regulations – which we have also analysed – we should study some aspects of its functions in some detail.

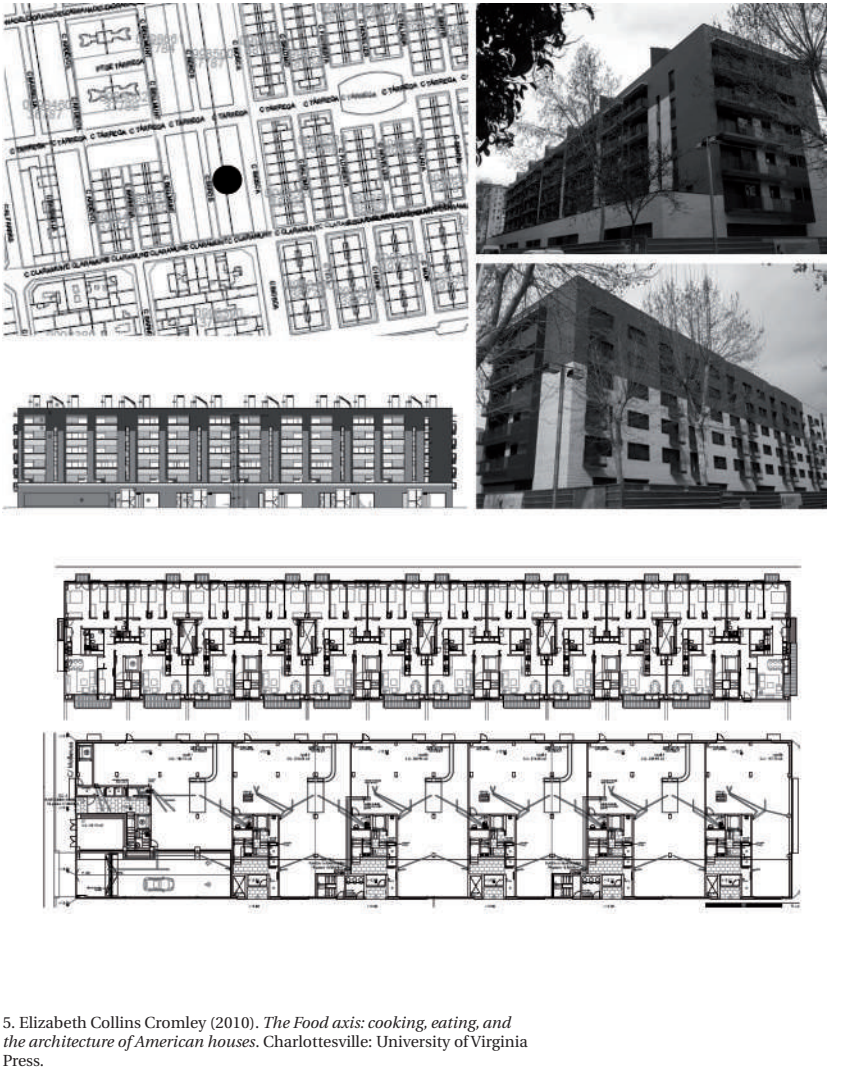
When food is brought into the home, it requires specific spaces for safe storage, particularly in the case of fresh food. Two more activities – cooking and washing before and after eating – complete the work triangle. This is the area of maximum functionality, and its dimensions and conditions must be given the fullest possible attention in the design.

The connection with the eating area, the kitchen's size and equipment (6 to 8 modules of 60 x 60 cm each, depending on the number of people living there) and the ability for more than one person to work in it at the same time are other qualitative considerations we have analysed in homes.

A project that proposes a very good solution for the functions involved in the food axis is Building E2 of Phase III of the Bon Pastor development, where Lalinde-Labarquilla propose a long kitchen linking the storage and eating spaces by means of a kitchen of variable width and with good lighting that facilitates simultaneous work and provides visibility of the route taken by food.

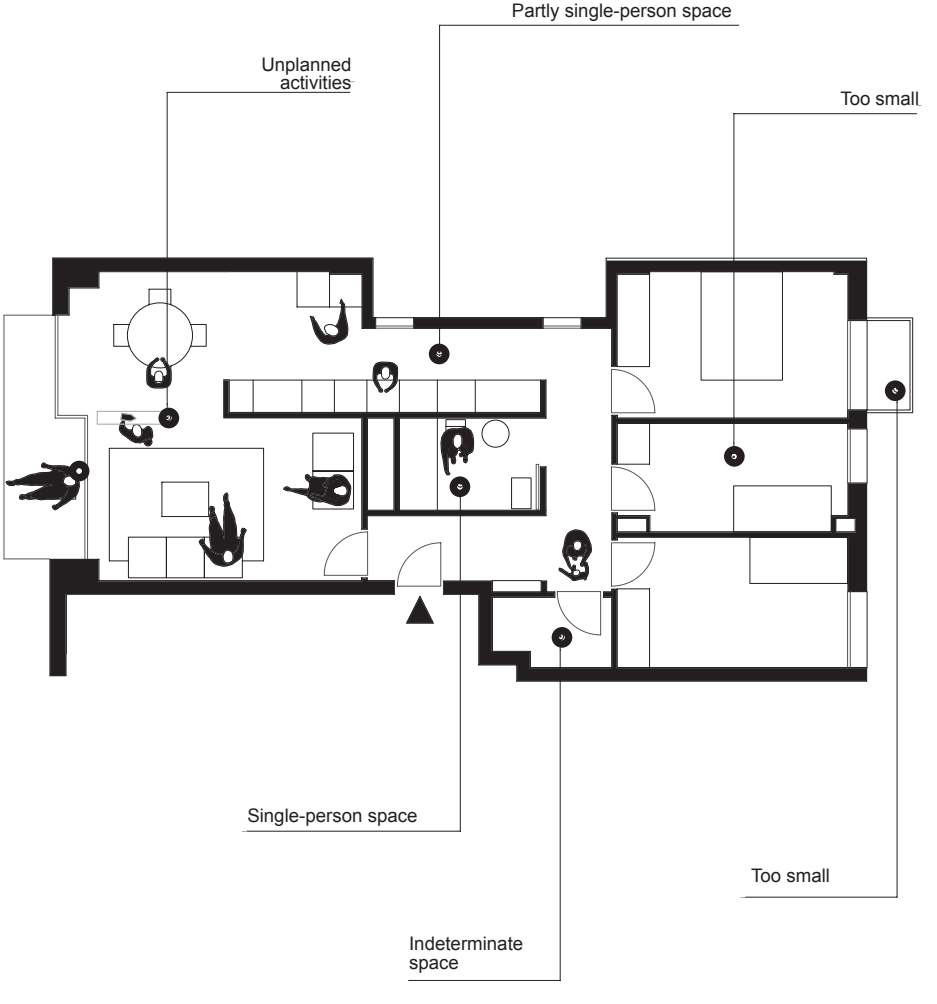
Bon Pastor Phase III - Building E2 - Carrer Alfarràs, 30-38 and Passeig Mollerusa, 20

60 homes for people affected by urban development
Architects: Lalinde-Labarquilla (project)/Marc Seguí (site management)



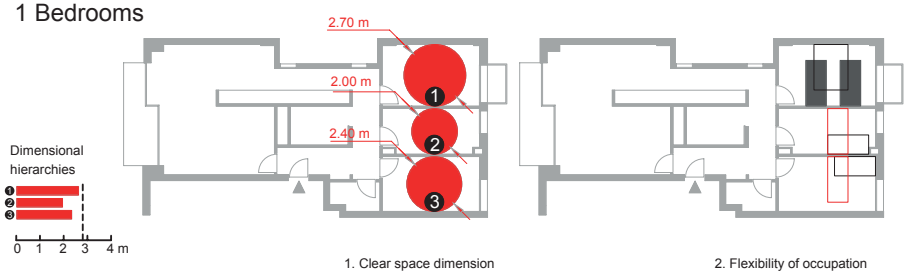
5. Elizabeth Collins Cromley (2010). *The Food axis: cooking, eating, and the architecture of American houses*. Charlottesville: University of Virginia Press.

Configuration



Flexibility of spaces

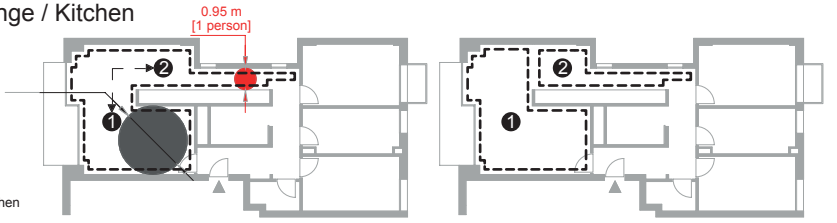
1 Bedrooms



1. Clear space dimension

2. Flexibility of occupation

2 Lounge / Kitchen

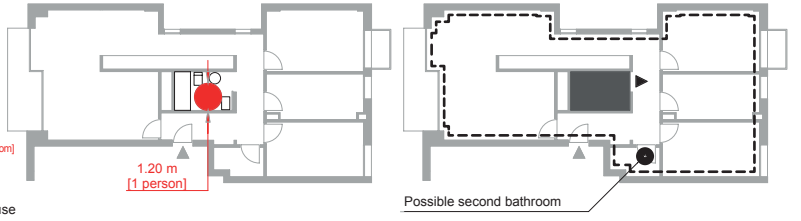


- Lounge/kitchen visibility
- Simultaneous uses
- Central nature of the whole

1. Visibility between the kitchen and the main living room

2. Simultaneous use

3 Bathrooms

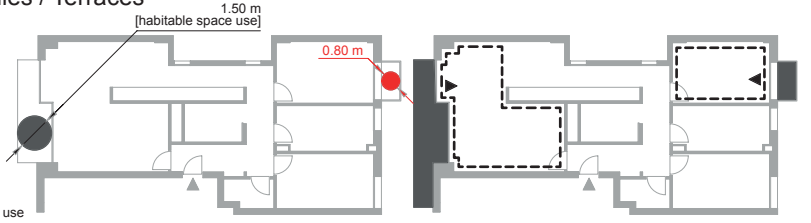


- Simultaneous use [1 compartmented bathroom]
- Simultaneous use [double bathroom]
- Care use
- Non-hierarchical use

1. Possible use

2. Restrictions on use

4 Balconies / Terraces



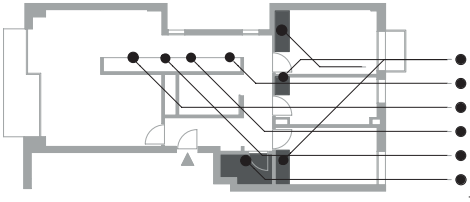
- Habitable space use
- Storage use
- Reproductive work use

1. Clear space dimension

2. Area of influence

Everyday uses

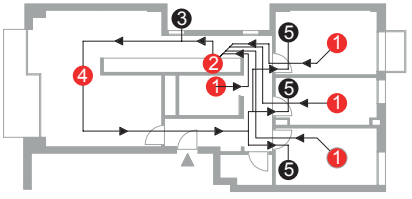
1 Storage



- Clothes 5.81 m³
- Pantry 0.90 m³
- Kitchen utensils 0.90 m³
- Cleaning products 0.30 m³
- Waste 0.30 m³
- Large 6.60m³

Total volume 14.81m³
14.81 m³/4=3.70 m³/room

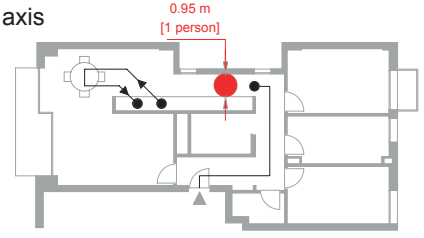
2 Laundry cycle

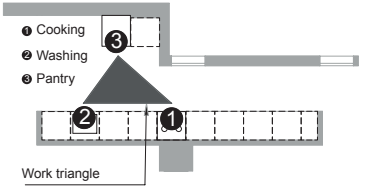


1. Dirty laundry
2. Washing
3. Hanging up/Drying
4. Folding/Ironing
5. Clean washing

Approx. aggregate distance travelled:29.28 m

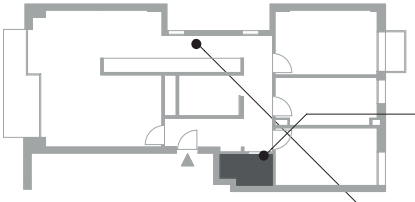
3 Food axis





- Dimensions
- Lighting
- Arrangement
- Fitting of 60 x 60 cm modules

4 Work spaces



- Possible reproductive work area
- Possible independent work area
- Possible dependent work area
- Reproductive work area

Work spaces

To complete our analysis, we looked at the ability of homes to host work activities. In this regard, we must make a distinction between paid work, which we will call 'productive work', and work that can be considered to be the tasks of everyday life related to the maintenance of the home, its functions or the care of one or more of its inhabitants, which we will call 'reproductive work'.

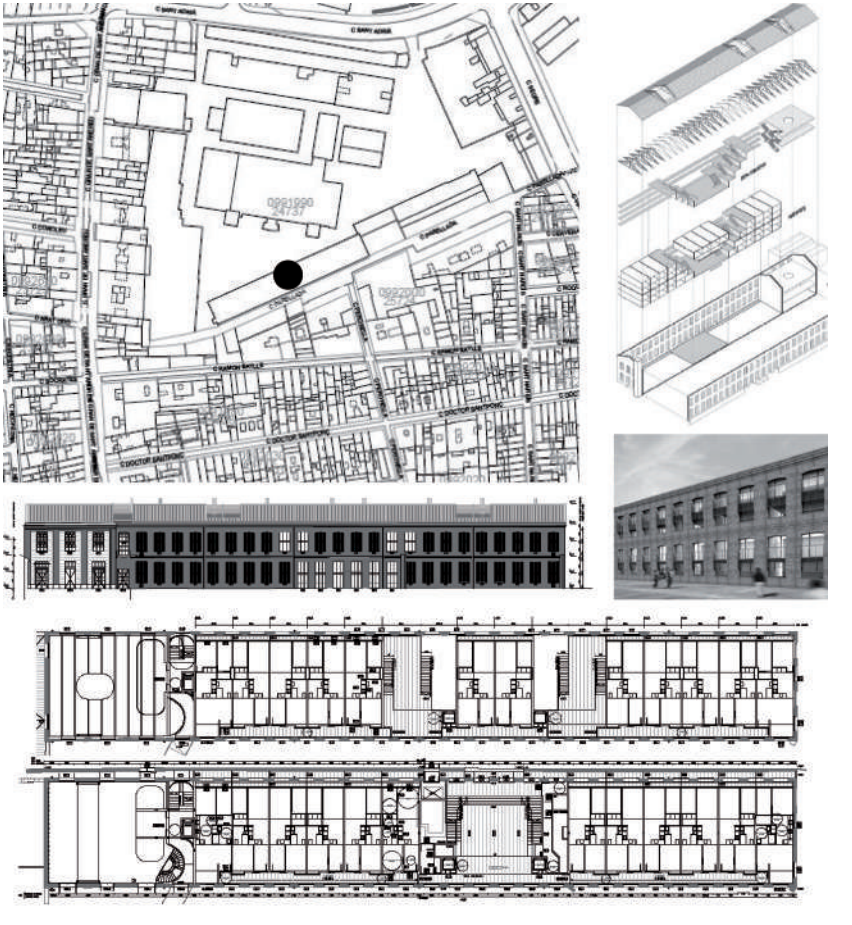
The first case relates to the fact, encouraged by the current labour market, that many professionals can work online without having to travel to a specific work place. Based on the structural configuration of homes, areas that make these activities possible, sometimes independently (without affecting the use of the home), and other times by means of a shared room or space, but temporarily affecting the natural use of that space, can be identified.

In the second case, it is a question of identifying the specific areas of the home expressly designed for reproductive activities, such as a laundry area that is closely linked to all the parts of the laundry cycle, a small additional space for maintenance, or even a small facility related to a specific space that enables these functions to be carried out.

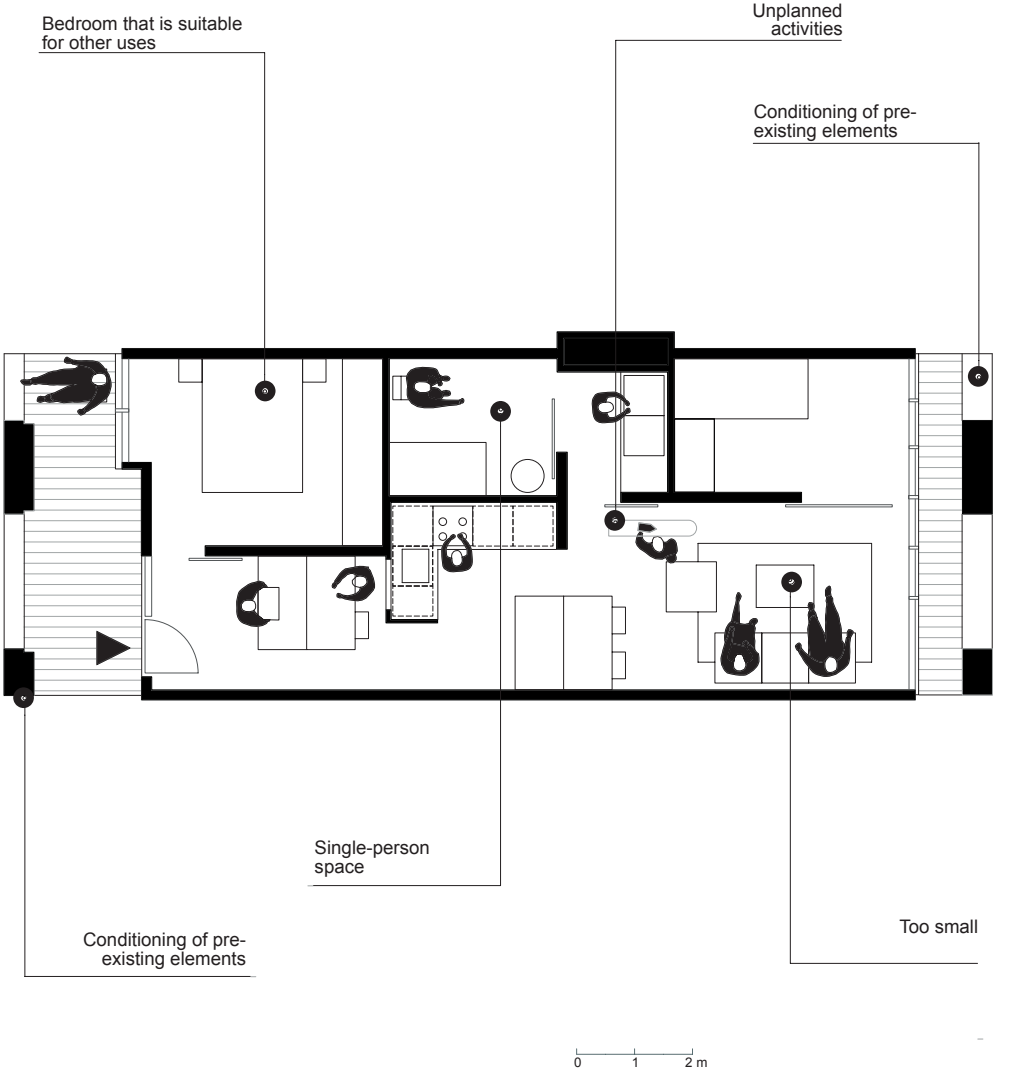
Some spaces make it possible to identify these areas when they have been designed without fully determining their function.

An interesting example of this is the Can Fabra housing project, where José Miguel Roldán and Mercè Berenguer propose an original configuration that adapts to the building's pre-existing constraints. Thus, the spaces as laid out make it possible to interpret areas suitable for independent work in the home (including the possibility of a separate entrance). Areas for housework and reproductive work are also envisaged.

Can Fabra - Carrer Parellada, 9
46 rental homes and premises for *Castellers*
Architects: José M. Roldán and Mercé Berenguer



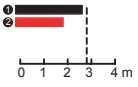
Configuration

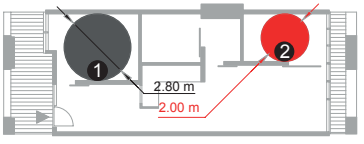


Flexibility of spaces

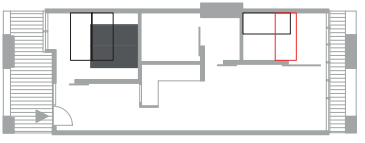
1 Bedrooms

Dimensional hierarchies





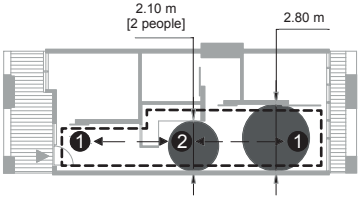
1. Clear space dimension



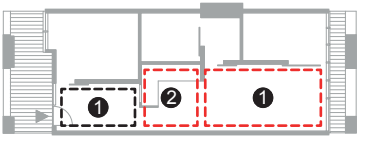
2. Flexibility of occupation

2 Lounge / Kitchen

- Lounge/kitchen visibility
- Simultaneous uses
- Central nature of the whole



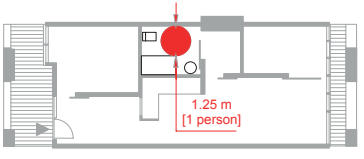
1. Visibility between the kitchen and the main living room



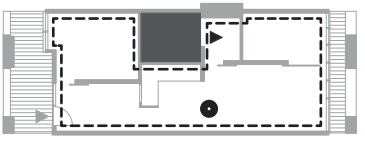
2. Simultaneous use

3 Bathrooms

- Simultaneous use [1 compartmented bathroom]
- Simultaneous use [double bathroom]
- Care use
- Non-hierarchical use



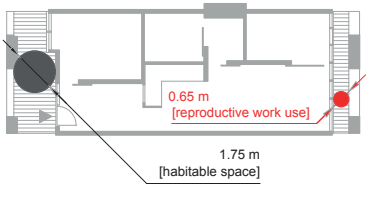
1. Possible use



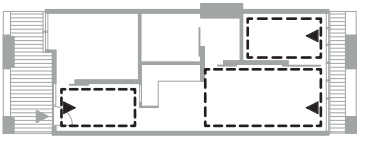
2. Restrictions on use

4 Balconies / Terraces

- Habitable space use
- Storage use
- Reproductive work use



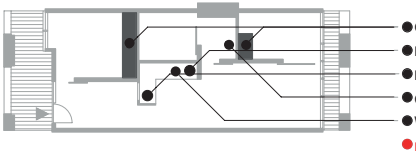
1. Clear space dimension



2. Area of influence

Everyday uses

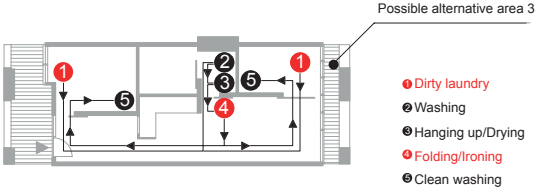
1 Storage



- Clothes 4.92 m³
- Pantry 0.90 m³
- Kitchen utensils 0.90 m³
- Cleaning products 0.90 m³
- Waste 0.30 m³
- Large

Total volume 7.92 m³
7.92 m³/3=2.64 m³/room

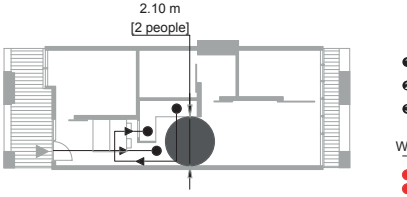
2 Laundry cycle

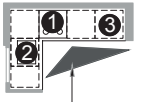


1. Dirty laundry
2. Washing
3. Hanging up/Drying
4. Folding/Ironing
5. Clean washing

Approx. aggregate distance travelled:28.20 m

3 Food axis



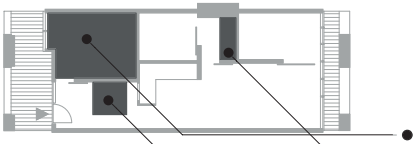


1. Cooking
2. Washing
3. Pantry

Work triangle

- Dimensions
- Lighting
- Arrangement
- Fitting of 60 x 60 cm modules

4 Work spaces

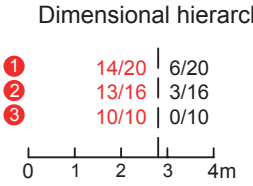


- Possible independent work area
- Possible dependent work area
- Reproductive work area

04. Summary statistics

Flexibility of spaces

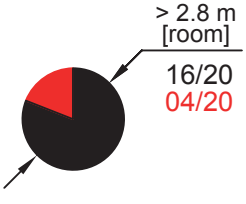
1 Bedrooms

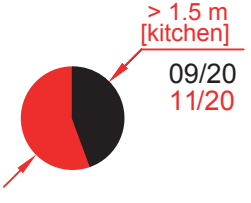


- Bedroom 1 06/20 14/20
- Bedroom 2 03/16 13/16
- Bedroom 3 00/10 10/10

2 Lounge / Kitchen

- Lounge / Kitchen visibility 16/20 04/20
- Simultaneous uses 13/20 07/20
- Central nature of the whole 14/20 06/20





Everyday uses

1 Storage

- Clothing 20/20 00/20
- Pantry 20/20 00/20
- Kitchen utensils 18/20 02/20
- Cleaning products 11/20 09/20
- Waste 20/20 00/20
- Large 13/20 07/20

Overall volume
> 2.5 m³/room

09/20
11/20

2 Laundry cycle

- Dirty laundry 00/20 20/20
- Washing 16/20 04/20
- Hanging up/Drying 19/20 01/20
- Folding/Ironing 05/20 15/20
- Clean washing 20/20 00/20

Flexibility of spaces

3 Bathrooms

- Simultaneous use [1 compartmented bathroom] — 02/20 18/20
- Simultaneous use [double bathroom] — 09/20 11/20
- Care use — 03/20 17/20
- Non-hierarchical use — 17/20 03/20

4 Balconies / Terraces

- Habitable space use — 10/20 10/20
- Storage use — 17/20 03/20
- Reproductive work use — 15/20 05/20

Everyday uses

3 Food axis

- Dimensions — 08/20 12/20
- Lighting — 10/20 10/20
- Arrangement — 13/20 07/20
- Equipment — 09/20 11/20

4 Work spaces

- Independent work area — 04/20 16/20
- Dependent work area — 03/20 17/20
- Reproductive work area — 16/20 04/20

05. Recommendations

Following a broad look at the results of the analysis conducted in this work, we have reached some conclusions that can be translated into recommendations to improve flexibility and reduce hierarchies in the residential configurations of new projects.

In this regard, we must emphasise the specific nature of the analysis, which is specifically aimed at residential units. The building as a whole includes critical aspects that have not been analysed here but which have a relative impact, an impact that isn't as directly relevant to the flexibility and hierarchies of space. In any event, the architectural approach to collective housing makes it possible to make configuration contributions that are beneficial to residential units. This is why the first recommendation affects the building as a whole.

Recommendation No. 1: Shared spaces

In view of the limited and sometimes very reduced dimensions of home configurations, the surface area and functional capacity of a home can be supplemented by shared spaces in the building reserved for use by its inhabitants. Their uses can be varied: compartmented or shared storage areas, areas for relaxation and leisure, communal outdoor spaces such as an accessible rooftop, or even small co-working spaces or small workshops.

This could have multiple benefits. On the one hand, the functional capabilities of the home are expanded without affecting any dimensions in its own configuration. On the other, it proposes uses that can reinforce involvement in the community and emotional ties between the building's inhabitants and neighbourhood.

The feasibility and appropriateness of this proposal are demonstrated in the experiences of institutional housing that can be seen in some of the projects analysed.

We recommend the inclusion of multi-use supplementary spaces, whose use can evolve over the useful life of the building.

With regard to the characteristics of the spaces analysed based on flexibility, we can identify two recommendations that summarise the answer to the failings detected.

Recommendation No. 2: Proposal relating to dimensions

The results of the analysis clearly show that the layouts most commonly proposed in projects coincide with the regulation of minimum surface areas stipulated in the habitability decree in force from time to time. This results in great dimensional diversity between bedrooms and in kitchen and bathroom spaces that are often intended for use by a single person with no ability to be shared or used simultaneously.

In order to avoid this, we recommend the inclusion of an additional sheet of technical specifications in bidding documents defining surface areas in accordance with flexibility criteria and the removal of hierarchies: bedrooms that are equivalent in terms of surface area and qualities, kitchens where two people can work and bathrooms that can be divided or converted into assisted spaces in future; and all this always from a housing perspective identified based on the number of inhabitants rather than the number of bedrooms.

Recommendation No. 3: Neutral and versatile spaces

The spaces with the least functional conditioning are the most suitable ones for individual appropriation by each inhabitant. Regardless of their dimensions, these areas are suitable for supplementing any use of the home (such as work, storage, provisional bedroom or laundry).

We recommend the inclusion of multi-use supplementary spaces, whose use can evolve over the useful life of the building. In relation to this,

we also recommend that its own outside spaces (balconies, terraces) have adequate dimensions for use as living spaces.

Finally, this set of recommendations can be supplemented by two aspects that can improve the functionality of homes in relation to everyday uses.

Recommendation No. 4: Spaces for reproductive work

A large number of the homes analysed lack spaces specifically intended for the laundry cycle. Only the drying area, which is governed by the habitability decree, is identified in most projects. In relation to this area, a specific surface area should be allocated to the other activities (collection of dirty laundry, washing and ironing) in order to increase its efficiency and visibility.

Storage spaces are predominantly individually allocated in bedrooms. They would be much more versatile if they were located in the home's shared areas, where they can perform a variety of functions in a more flexible manner.

Recommendation No. 5: Identification of functions

In terms of the methods used for this report, we looked at housing configurations with a common criterion that permitted the identification of uses and functions. In spite of this, residential floor plans often fail to correctly identify all everyday uses.

We recommend the possibility of a requirement for a floor plan identifying all storage devices (up to the requirement of approximately 2.5 cubic metres per inhabitant) and spaces for the laundry cycle and food axis (specifically indicating the work triangle). The aim is not only to ensure the recognition of these spaces by regulatory bodies but, primarily, to use architectural representation also as a form of communication between blueprint designers and users.

Storage spaces are predominantly individually allocated in bedrooms. They would be much more versatile if they were located in the home's shared areas, where they can perform a variety of functions in a more flexible manner.

We can conclude by adding that these recommendations can be interpreted as a useful tool (that could well be a collaborative and participatory one) during the home configuration design process. In short, their aim is for the blueprint designer to identify with the many possible inhabitants based on the virtual and daily occupation of developments.

Interior of a home in the Glòries serviced housing development for the elderly.

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